INFORMATION TO OFFERORS OR QUOTERS
SECTION A - COVER SHEET

1. SOLICITATION NUMBER	2. *(X one)*	
		a. SEALED BID
N00173-00-R-RS01	X	b. NEGOTIATED *(RFP)*
		c. NEGOTIATED *(RFQ)*

INSTRUCTIONS

NOTE THE AFFIRMATIVE ACTION REQUIREMENT OF THE EQUAL OPPORTUNITY CLAUSE WHICH MAY APPLY TO THE CONTRACT RESULTING FROM THIS SOLICITATION.

You are cautioned to note the "Certification of Non-Segregated Facilities" in the solicitation. Failure to agree to the certification will render your reply nonresponsive to the terms of solicitations involving awards of contracts exceeding $25,000 which are not exempt from the provisions of the Equal Opportunity clause.

"Fill-ins" are provided on the face and reverse of Standard Form 18 and Parts I and IV of Standard Form 33, or other solicitation documents and Sections of Table of Contents in this solicitation and should be examined for applicability.

See the provision of this solicitation entitled either "Late Bids, Modifications of Bids or Withdrawal of Bids" or "Late Proposals, Modifications of Proposals and Withdrawals of Proposals."

When submitting your reply, the envelope used must be plainly marked with the Solicitation Number, as shown above and the date and local time set forth for bid opening or receipt of proposals in the solicitation document.

If NO RESPONSE is to be submitted, detach this sheet from the solicitation, complete the information requested on reverse, fold, affix postage, and mail. NO ENVELOPE IS NECESSARY.

Replies must set forth full, accurate, and complete information as required by this solicitation *(including attachments)*. The penalty for making false statements is prescribed in 18 U.S.C. 1001.

3. ISSUING OFFICE *(Complete mailing address, including ZIP Code)*

PROCURING CONTRACT ING OFFICE (CODE 3250.RDS)
NAVAL RESEARCH LABORATORY
DEPARTMENT OF THE NAVY
STENNIS SPACE CENTER, MS 39529-5004

4. ITEMS TO BE PURCHASED *(Brief description)*

SPACE SCIENCE RESEARCH, DEVELOPMENT AND ENGINEERING EFFORTS

5. PROCUREMENT INFORMATION *(X and complete as applicable)*

X	a. THIS PROCUREMENT IS UNRESTRICTED					
	b. THIS PROCUREMENT IS A _____ % SET-ASIDE FOR ONE OF THE FOLLOWING *(X one). (See Section I of the Table of Contents in this solicitation for details of the set-aside.)*					
		(1) Small Business		(2) Labor Surplus Area Concerns		(3) Combined Small Business/Labor Area Concerns

6. ADDITIONAL INFORMATION

THE NAVAL RESEARCH LABORATORY CONTRACTING DIVISION ISSUES SOLICITATIONS AND AMENDMENTS TO SOLICITATIONS ELECTRONICALLY VIA THE INTERNET AT THE FOLLOWING WEBSITE: HTTP://HERON.NRL.NAVY.MIL/CONTRACTS/HOME.HTM.

ANY AMENDMENTS TO THIS SOLICITATION WILL BE POSTED AT THAT WEBSITE. AMENDMENTS WILL NOT BE DISTRIBUTED BY ANY OTHER MEANS. IT IS THE RESPONSIBILITY OF POTENTIAL OFFERORS TO PERIODICALLY REVIEW THE WEBSITE FOR AMENDMENTS TO THIS SOLICITATION.

7. POINT OF CONTACT FOR INFORMATION

a. NAME *(Last, First, Middle Initial)*	b. ADDRESS *(Include Zip Code)*
Sewell, Richard D.	PROCURING CONTRACTING OFFICE (CODE 3250)
c. TELEPHONE NUMBER *(Include Area Code and Extension) (NO COLLECT CALLS)* (601) 688-5784	NAVAL RESEARCH LABORATORY STENNIS SPACE CENTER, MS 39529-5004

DD FORM 1707, MAR 90 Previous editions are obsolete.

8. REASONS FOR NO RESPONSE *(X all that apply)*			
	a. CANNOT COMPLY WITH SPECIFICATIONS		b. CANNOT MEET DELIVERY REQUIREMENT
	c. UNABLE TO IDENTIFY THE ITEM(S)		d. DO NOT REGULARLY MANUFACTURE OR SELL THE TYPE OF ITEMS INVOLVED
	e. OTHER *(Specify)*		

9. MAILING LIST INFORMATION *(X one)*				
	YES		NO	WE DESIRE TO BE RETAINED ON THE MAILING LIST FOR FUTURE PROCUREMENT OF THE TYPE OF TIME(S) INVOLVED.

10. RESPONDING FIRM	
a. COMPANY NAME	b. ADDRESS *(Include Zip Code)*

c. ACTION OFFICER			
(1) Typed or Printed Name *(Last, First, Middle Initial)*	(2) Title	(3) Signature	(4) Date Signed *(YYMMDD)*

DD FORM 1707 REVERSE, MAR 90

FOLD FOLD

FOLD FOLD

FROM

AFFIX STAMP HERE

SOLICITATION NUMBER	
N00173-00-R-RS01	
DATE *(YYMMDD)*	LOCAL TIME
99 DEC 27	3:30PM

TO

SOLICITATION, OFFER AND AWARD	1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350) ▶	RATING DO-C9	PAGE OF 1 | 31 PAGES

2. CONTRACT NO.	3. SOLICITATION NO.	4. TYPE OF SOLICITATION	5. DATE ISSUED	6. REQUISITION/PURCHASE NO.
	N00173-00-R-RS01	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	24 NOV 99	

7. ISSUED BY	CODE N00173	8. ADDRESS OFFER TO *(If other than Item 7)*
PROCURING CONTRACTING OFFICER, CODE 3235.RDS NAVAL RESEARCH LABORATORY DEPARTMENT OF THE NAVY STENNIS SPACE CENTER, MS 39529-5004		

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

SOLICITATION

9. Sealed offers in original and 05 copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in Bldg 1100, SSC,MS 39529-5004 until 3:30 *(Hour)* local time 27 DEC 99 *(Date)*

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-10. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL: ▶	A. NAME	B. TELEPHONE NO. *(Include area code) (NO COLLECT CALLS)*
	Richard Sewell	(228)688-5784

11. TABLE OF CONTENTS

(✓)	SEC.	DESCRIPTION	PAGE(S)	(✓)	SEC.	DESCRIPTION	PAGE(S)
		PART I - THE SCHEDULE				PART II - CONTRACT CLAUSES	
X	A	SOLICITATION/CONTRACT FORM	1	X	I	CONTRACT CLAUSES	15-19
X	B	SUPPLIES OR SERVICES AND PRICES/COSTS	2-3			PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH.	
X	C	DESCRIPTION/SPECS./WORK STATEMENT	4	X	J	LIST OF ATTACHMENTS	20
X	D	PACKAGING AND MARKING	4			PART IV - REPRESENTATIONS AND INSTRUCTIONS	
X	E	INSPECTION AND ACCEPTANCE	5	X	K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	21
X	F	DELIVERIES OR PERFORMANCE	6				
X	G	CONTRACT ADMINISTRATION DATA	7-10	X	L	INSTRS., CONDS., AND NOTICES TO OFFERORS	22-29
X	H	SPECIAL CONTRACT REQUIREMENTS	11-14	X	M	EVALUATION FACTORS FOR AWARD	30-31

OFFER *(Must be fully completed by offeror)*

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days *(60 calendar days unless a different period is inserted by the offeror)* from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT *(See Section I, Clause No. 52-232-8)* ▶	10 CALENDAR DAYS %	20 CALENDAR DAYS %	30 CALENDAR DAYS %	CALENDAR DAYS %

14. ACKNOWLEDGMENT OF AMENDMENTS *(The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated:*	AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR	CODE	FACILITY	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*

15B. TELEPHONE NO. *(Include area code)*	15C. ☐ CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE.	17. SIGNATURE	18. OFFER DATE

AWARD *(To be completed by Government)*

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:

☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )

23. SUBMIT INVOICES TO ADDRESS SHOWN IN ▶ *(4 copies unless otherwise specified)* — ITEM

24. ADMINISTERED BY *(If other than Item 7)*	CODE	25. PAYMENT WILL BE MADE BY	CODE

26. NAME OF CONTRACTING OFFICER *(Type or print)*	27. UNITED STATES OF AMERICA *(Signature of Contracting Officer)*	28. AWARD DATE

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

I

PART I - THE SCHEDULE
SECTION B
SUPPLIES OR SERVICES AND PRICES/COSTS

B-1 SUPPLIES/SERVICES AND COSTS

ITEM NUMBER	SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE	ESTIMATED COST PLUS FIXED FEE
0001	The Contractor shall provide the necessary personnel, equipment and facilities to accomplish the work as described in Section C.	$	$	$
0002	Reports, Data, Software and Documentation in accordance with Exhibit A (DD 1423) and Attachment (1)	* NSP	* NSP	* NSP
OPTION ONE (YEAR 2)				
0003	The Contractor shall provide the necessary personnel, equipment and facilities to accomplish the work as described in Section C.	$	$	$
0004	Reports, Data, Software and Documentation in accordance with Exhibit A (DD 1423) and Attachment (1)	* NSP	* NSP	* NSP
OPTION TWO (YEAR 3)				
0005	The Contractor shall provide the necessary personnel, equipment and facilities to accomplish the work as described in Section C.	$	$	$

0006	Reports, Data, Software and Documentation in accordance with Exhibit A (DD 1423) and Attachment (1)	* NSP	* NSP	* NSP

OPTION THREE (YEAR 4)

0007	The Contractor shall provide the necessary personnel, equipment and facilities to accomplish the work as described in Section C.	$	$	$
0008	Reports, Data, Software and Documentation in accordance with Exhibit A (DD 1423) and Attachment (1)	* NSP	* NSP	* NSP

OPTION FOUR (YEAR 5)

0009	The Contractor shall provide the necessary personnel, equipment and facilities to accomplish the work as described in Section C.	$	$	$
0010	Reports, Data, Software and Documentation in accordance with Exhibit A (DD 1423) and Attachment (1)	* NSP	* NSP	* NSP

TOTAL ESTIMATED COST PLUS FIXED FEE: $ $ $
(If All Options are Exercised)

*Not Separately Priced

SECTION C
DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK

C-1 STATEMENT OF WORK

The work and services to be performed hereunder shall be subject to the requirements and standards contained in Attachment (1), Statement of Work, Attachment (2), Workforce Qualifications and Experience, Exhibit A, Contract Data Requirements List, all other Attachments cited in Section J, which are incorporated by reference into Section C, and the Contractor's technical proposal which may be incorporated by reference in any resulting contract.

C-2 REQUIREMENTS FOR ON-SITE CONTRACTORS

For those portions of the work under this contract performed at any NRL site, the contractor shall comply with the Requirements for On-Site Contractors dated 02 February 1998 which are hereby incorporated by reference. The full text is available at http://heron.nrl.navy.mil/contracts/home.htm.

SECTION D
PACKAGING AND MARKING

D-1 PACKAGING AND MARKING

Preservation, packaging, packing and marking of all deliverable contract line items must conform to normal commercial packing standards to assure safe delivery at destination.

SECTION E
INSPECTION AND ACCEPTANCE

E-1 INSPECTION AND ACCEPTANCE CLAUSES INCORPORATED BY REFERENCE

FAR CLAUSE TITLE

52.246-8 - Inspection Of Research And Development - Cost Reimbursement (APR 1984)

DFARS CLAUSE TITLE

252.246-7000 - Material Inspection And Receiving Report (DEC 1991)

E-2 INSPECTION AND ACCEPTANCE

Inspection and acceptance of the final delivery will be accomplished by the Technical Manager (TM) or Contracting Officer Representative (COR) designated in Section G of this contract. Inspection and acceptance will be performed at the Naval Research Laboratory, Washington DC 20375-5320.

SECTION F
DELIVERIES OR PERFORMANCE

F-1 DELIVERIES OR PERFORMANCE CLAUSES INCORPORATED BY REFERENCE:

FAR CLAUSE		TITLE
52.242-15	-	Stop-Work Order (AUG 1989) - Alternate I (APR 1984)
52.247-34	-	F.O.B. Destination (NOV 1991)

F-2 PERIOD AND PLACE OF PERFORMANCE

(a) The term of this contract shall be for a period of twelve (12) months from the date of contract award. The period of performance for each subsequent option, if exercised, shall be for an additional twelve (12) month period.

(b) The principal place of performance of this contract shall be *
(* To be filled in at time of award)

(The Government anticipates that 100% of the required effort will be performed at the Contractor's site.)

SECTION G
CONTRACT ADMINISTRATION DATA

G-1 PROCURING OFFICE REPRESENTATIVE

In order to expedite administration of the contract, the Administrative Contracting Officer (ACO) will direct inquiries to the appropriate office listed below. Please do not direct routine inquiries to the person listed in Item 20A on Standard Form 26.

Contract Matters- *

Security Matters- *

Safety Matters- *

Patent Matters- *

Release of Data- *

The ACO will forward invention disclosures and reports directly to the Associate Counsel for Patents, Code 1008.2, Naval Research Laboratory, Washington DC 20375-5320. The Associate Counsel for Patents will return the reports along with a recommendation to the Administrative Contracting Officer. The Associate Counsel for Patents will represent the Contracting Officer with regard to invention reporting matters arising under this contract.

(* To be filled in at time of award)

G-2 CONTRACTING OFFICER'S REPRESENTATIVE (COR) - FUNCTIONS AND LIMITATIONS

* is hereby designated the cognizant COR who will represent the Contracting Officer in the administration of technical details within the scope of this contract and inspection and acceptance. The COR is not otherwise authorized to make any representations or commitments of any kind on behalf of the Contracting Officer or the Government. The COR does not have the authority to alter the Contractor's obligations or change the specifications in the contract. If, as a result of technical discussions, it is desirable to alter contract obligations or statements of work, a modification must be issued in writing and signed by the Contracting Officer. The COR is responsible for reviewing the bills and charges submitted by the Contractor and informing the ACO of areas where exceptions are to be taken.

(* To be filled in at time of award)

G-3 TECHNICAL DIRECTION MEMORANDUM (TDM)

(a) For the purposes of this clause, technical direction includes the following:
   (1) Direction to the Contractor which shifts work emphasis between work areas or tasks, requires pursuit of certain lines of inquiry, fills in details or otherwise describes work which will accomplish the objectives described in the statement of work;
   (2) Guidelines to the Contractor which assist in interpretation of drawings, specifications or

technical portions of work description.

(b) Technical instructions must be within the scope of work stated in the contract. Technical instructions may not be used to:

(1) Assign additional work under the contract:
(2) Direct a change as defined in the contract clause entitled "Changes";
(3) Increase or decrease the estimated contract cost, the fixed fee, or the time required for contract performance; or
(4) Change any of the terms, conditions or specifications of the contract

(c) The TDM shall be written by the Contracting Officer's Representative (COR), with the original given to the Contractor and a copy retained in the CORs file. Technical direction may be issued orally only in emergency situations. If technical direction is issued orally, a TDM must follow within two (2) working days from the date of the oral direction. Amendments, corrections, or changes to TDMs shall also be in written format and shall include all the information set forth in paragraph (e) below.

(d) A TDM shall be considered issued when the Government deposits it in the mail, or if transmitted by other means, when it is physically delivered to the contractor.

(e) TDMs shall include, but not be limited to, the following information:

(1) Date of TDM,
(2) Contract Number,
(3) Reference to the relevant portion or item in the Statement of Work,
(4) The specific technical direction or clarification, and
(5) The signature of the COR.

(f) CORs shall retain all files containing TDMs for a period of two (2) years after the final contract completion date.

(g) The only individual authorized in any way to amend or modify any of the terms of this contract shall be the Contracting Officer. When, in the opinion of the Contractor, any technical direction calls for effort outside the scope of the contract or inconsistent with this special provision, the Contractor shall notify the Contracting Officer in writing within ten (10) working days after its receipt.

G-4 CONTRACTOR-ACQUIRED PROPERTY

(a) The contractor is authorized to acquire the following items of facilities which are needed to accomplish this contract.

Items to be Acquired	Estimated Cost

(To be filled in at time of award)

(b) This authorization does not constitute any consent required pursuant to the contract clause entitled "Subcontracts" (FAR 52.244-2). Advance notification or requests for consent pursuant to that clause shall be directed to the administrative contracting officer (ACO).

(c) Pursuant to the contract clause entitled "Government Property (Cost-Reimbursement, Time-and-Material, or Labor-Hour Contracts)" (FAR 52.245-5), title to the property shall vest in the Government.

(d) Prior to acquisition of any item of Industrial Plant Equipment, the Contractor must comply with the

requirements of Department of Defense Federal Acquisition Regulation Supplement (DFARS 245.302-1(b)(1)(A). (See DFARS 245.301 for definition of "Industrial Plant Equipment.")

G-5 SUBCONTRACTORS/CONSULTANTS

(a) Advance notification or requests for consent pursuant to the contract clause entitled "Subcontracts" (FAR 52.244-2) shall be directed to the cognizant administrative contracting officer (ACO).
(b) The following subcontractors/consultants have been identified in the Contractor's proposal as necessary for performance of this contract:

Subcontractor/Consultant Name	Estimated Cost

(*Paragraph (b) will be included and filled in at time of award if subcontractor/consultants are proposed by the successful offeror)*

G-6 NAPS 5252.232-9001 - SUBMISSION OF INVOICES (COST-REIMBURSEMENT, TIME-AND-MATERIALS, LABOR-HOUR, OR FIXED PRICE INCENTIVE (JUL 1992)

(a) "Invoice" as used in this clause includes contractor requests for interim payments using public vouchers (SF 1034) but does not include contractor requests for progress payments under fixed price incentive contracts.
(b) The Contractor shall submit invoices and any necessary supporting documentation, in an original and 4 copies, to the contract auditor at the following address:

(To be filled in at time of award)

unless delivery orders are applicable, in which case invoices will be segregated by individual order and submitted to the address specified in the order. In addition, an information copy shall be submitted to [See Section G for designated COR]. Following verification, the contract auditor will forward the invoice to the designated payment office for payment in the amount determined to be owing, in accordance with the applicable payment (and fee) clause(s) of this contract.
(c) Invoices requesting interim payments shall be submitted no more than once every two weeks, unless another time period is specified in the Payments clause of this contract. For indefinite delivery type contracts, interim payment invoices shall be submitted no more than once every two weeks for each delivery orders. There shall be a lapse of no more than 30 calendar days between performance and submission of an interim payment invoice.
(d) In addition to the information identified in the Prompt Payment clause herein, each invoice shall contain the following information, as applicable:

(1) Contract line item number (CLIN)
(2) Subline item number (SLIN)
(3) Accounting Classification Reference Number(ACRN)
(4) Payment terms
(5) Procuring activity
(6) Date supplies provided or services performed
(7) Costs incurred and allowable under the contract
(8) Vessel (e.g., ship, submarine or other craft) or system for which supply/service is provided

(e) A DD Form 250, "Material Inspection and Receiving Report",
** is required with each invoice submittal.
** is required only with the final invoice.
** is not required.

(f) A Certificate of Performance
** shall be provided with each invoice submittal.
** is not required.

(g) The Contractor's final invoice shall be identified as such, and shall list all other invoices (if any) previously tendered under this contract.

(h) Cost of performance shall be segregated, accumulated and invoiced to the appropriate ACRN categories to the extent possible. When such segregation of costs by ACRN is not possible for invoices submitted with CLIN/SLINS with more than one ACRN, an allocation ratio shall be established in the same ratio as the obligations cited in the accounting data so that costs are allocated on a proportional basis.

G-7 INCREMENTAL FUNDING

Pursuant to the Limitation of Funds clause (FAR 52.232-22), the total amount allotted to this contract is $* and it is estimated that this amount is sufficient for contract performance through *.

(* this provision will be included and completed at time of award, if applicable)

G-8 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (COST-REIMBURSEMENT)

The purpose of these instructions is to permit the paying office to charge the accounting classification citations in the contract in a manner that reflects the performance of the contract. These instructions do not create any obligation on the part of the Government or the contractor nor do they in any way alter any obligation created by any other provision of the contract. Invoices should be paid from available ACRNs in the following order:

(a) ACRNs cited on the contractor's invoice.

(b) On a proportional basis from any ACRNs assigned to funds which will cancel at the end of the current fiscal year.

(c) The ACRN assigned to the following line of accounting:
97X4930.NH4A 000 77777 0 000173 2F 000000 N00173Z45000.

(d) If funds appropriated in more than one fiscal year are allotted to the contract, the ACRN assigned to the oldest allotment of funds.

(e) On a proportional basis from all ACRNs assigned to allotments of funds appropriated in a single fiscal year.

SECTION H
SPECIAL CONTRACT REQUIREMENTS

H-1 TYPE OF CONTRACT

This is a

(To be completed at time of award)

H-2 ONR 5252.237-9705 - KEY PERSONNEL (DEC 88)

(a) The Contractor agrees to assign to the contract tasks those persons whose resumes were submitted with its proposal and who are necessary to fulfill the requirements of the contract as "key personnel". No substitutions may be made except in accordance with this clause.
(b) The Contractor understands that during the first ninety (90) days of the contract performance period, no personnel substitutions will be permitted unless these substitutions are unavoidable because of the incumbent's sudden illness, death or termination of employment. In any of these events, the Contractor shall promptly notify the Contracting Officer and provide the information described in paragraph (c) below. After the initial ninety (90) day period the Contractor must submit to the Contracting Officer all proposed substitutions, in writing, at least fifteen (15) days in advance (thirty (30) days if security clearance must be obtained) of any proposed substitution and provide the information required by paragraph (c) below.
(c) Any request for substitution must include a detailed explanation of the circumstances necessitating the proposed substitution, a resume for the proposed substitute, and any other information requested by the Contracting Officer. Any proposed substitute must have qualifications equal to or superior to the qualifications of the incumbent. The Contracting Officer or his/her authorized representative will evaluate such requests and promptly notify the Contractor of his/her approval or disapproval thereof.
(d) In the event that any of the identified key personnel cease to perform under the contract and the substitute is disapproved, the contract may be immediately terminated in accordance with the Termination clause of the contract.
The following are identified as key personnel:

(To be completed at time of award)

H-3 ONR 5252.216-9706 - LEVEL OF EFFORT (DEC 88)

(a) The Contractor agrees to provide the total level of effort specified in the next sentence in performance of the work described in this contract. The total level of effort for performance of this contract shall be 31,900 total hours of direct labor for the base year and 31,900 total hours for each of the option years. The total shall include subcontractor direct labor for those subcontractors specifically identified in the Contractor's proposal as having hours included in the proposed level of effort. A breakdown of labor categories and hours is set forth in paragraph (k) below.
(b) The level of effort for this contract shall be expended at an average rate of 2658.33 hours per month. It is understood and agreed that the rate of hours per month may fluctuate in pursuit of the technical objective, provided such fluctuation does not result in the use of the total hours of effort prior to the

expiration of the term of the contract.

(c) The Contractor is required to notify the Contracting Officer when any of the following situations occur, or are anticipated to occur: If during any three consecutive months the monthly average is exceeded by 25% or, if at any time it is forecast that during the last three months of the contract less than 50% of the monthly average will be used during any given month; or, when 85% of the total level of effort has been expended.

(d) If, during the term of the contract, the Contractor finds it necessary to accelerate the expenditure of direct labor to such an extent that the total hours of effort specified would be used prior to the expiration of the term, the Contractor shall notify the Contracting Officer in writing, setting forth the acceleration required, the probable benefits which would result, and an offer to undertake the acceleration at no increase in the estimated cost or fixed fee together with an offer setting forth a proposed level of effort, cost breakdown, and proposed fixed fee for continuation of the work until expiration of the term hereof. The offer shall provide that the work proposed will be subject to the terms and conditions of this contract and any additions or changes required by then current law, regulations, or directives, and that the offer, with a written notice of acceptance by the Contracting Officer, shall constitute a binding contract. The Contractor shall not accelerate any effort until receipt of such written approval by the Contracting Officer. Any agreement to accelerate will be formalized by contract modification.

(e) The Contracting Officer may, by written order, direct the Contractor to accelerate the expenditure of direct labor such that the total hours of effort specified in paragraph (a) above would be used prior to the expiration of the term. This order shall specify the acceleration required and the resulting revised term. The Contractor shall acknowledge this order within five days of receipt.

(f) If the total level of effort specified in paragraph (a) above is not provided by the Contractor during the term of this contract, the Contracting Officer shall either (i) reduce the fixed fee of this contract as follows:

$$\text{Fee Reduction} = \text{Fixed Fee} \times \frac{\text{Required LOE Hours - Expended LOE Hours}}{\text{Required LOE Hours}}$$

or (ii) subject to the provisions of the clause of this contract entitled "Limitation of Cost," require the Contractor to continue to perform the work until the total number of hours of direct labor specified in paragraph (a) shall have been expended, at no increase in the fixed fee of this contract.

(g) In the event the government fails to fully fund the contract in a timely manner, the term of the contract may be extended accordingly with no change to cost or fee. If the government fails to fully fund the contract, the fee will be adjusted in direct proportion to that effort which was performed.

(h) Notwithstanding any of the provisions in the above paragraphs, the Contractor may furnish hours up to five percent in excess of the total hours specified in paragraph (a) above, provided that the additional effort is furnished within the term hereof, and provided further that no increase in the estimated cost or fixed fee is required, and no adjustment in the fixed fee shall be made provided that the Contractor has delivered at least 95% of the level of effort required in paragraph (a) above.

(i) It is understood that the mix of labor categories provided by the Contractor under the contract, as well as the distribution of effort among those categories, may vary considerably from the initial mix and distribution of effort which was estimated by the government or proposed by the Contractor.

(j) Nothing herein shall be construed to alter or waive any of the rights or obligations of either party pursuant to the Clause entitled "Limitation of Costs" or "Limitation of Funds," either of which clauses as incorporated herein applies to this contract.

(k) The anticipated breakdown by labor category of the total level of effort is as follows:

For Proposal and Informational Purposes Only: The Offeror may assume that the estimated maximum number of hours is equally distributed to each of the base and option years.

Labor Category	Hours
Program Manager	200
Senior Thermal Engineer	950
Thermal Engineer	1900
Senior Contamination Engineer	950
Contamination Engineer	1900
Senior Instrument Optical Engineer	950
Instrument Optical Engineer	1900
Senior Systems Engineer	950
Systems Engineer	1900
Senior Electrical Engineer	475
Electrical Engineer	1900
Senior Electromechanical Systems Engineer	950
Electromechanical Systems Engineer	1900
Senior Mechanical Systems Engineer	950
Mechanical Systems Engineer	1900
Junior Engineer	7000
Senior Mechanical Designer	950
Mechanical Designer	950
Junior Designer	950
Senior Integration Technician	475
Integration Technician	950
Junior Technician	950

H-4 ONR 5252.235-9714 - REPORT PREPARATION (FEB 97)

Scientific or technical reports prepared by the Contractor and deliverable under the terms of this contract will be prepared in accordance with format requirements contained in ANSI/NISO Z39.18-1995, "Scientific and Technical Reports: Elements, Organization, and Design. "[NOTE: ANSI Z39.18 may be obtained from NISO Press Fulfillment Center, P. O. Box 338, Oxon Hill, MD. 20750-0338.Telephone 1-800-282-6476]

H-5 OPTION TO EXTEND TERM

This contract shall be renewable at the unilateral option of the Government by the Contracting Officer's notice of renewal to the Contractor within the existing term of the contract.

H-6 ON-SITE USE OF GOVERNMENT PROPERTY

It is anticipated that Government property will be used by the contractor's personnel in the performance of that portion of the contract performed on-site at the U.S. Naval Research Laboratory (NRL) including any of its field sites. Such use will be on a rent free basis and all such property shall be considered to remain in the possession and control of the NRL for property responsibility and accountability purposes.

H-7 GOVERNMENT-FURNISHED PROPERTY

The following Government property will be furnished to the contractor on a rent-free basis for use in performing the contract:

(To be filled in at time of award)

H-8 YEAR 2000 COMPLIANT INFORMATION TECHNOLOGY

This requirement applies to information technology (IT) that processes date-related information. All such IT delivered under this contract shall be Year 2000 compliant as defined at FAR 39.002.

H-9 REPRESENTATIONS AND CERTIFICATIONS

The Contractor’s completed Representations, Certifications, and Other Statements of Offerors or Respondents is incorporated herein by reference in any resultant award.

PART II - CONTRACT CLAUSES
SECTION I
CONTRACT CLAUSES

I-1 52.252-2 - CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.
Also, the full text of a clause may be accessed electronically at this/these address(es):

http://www.arnet.gov/far
http://heron.nrl.navy.mil/contracts/home.htm

a. FEDERAL ACQUISITION REGULATION CLAUSES

FAR CLAUSE		TITLE
52.202-1	-	Definitions (OCT 1995)
52.203-3	-	Gratuities (APR 1984)
52.203-5	-	Covenant Against Contingent Fees (APR 1984)
52.203-6	-	Restrictions On Subcontractor Sales To The Government (JUL 1995)
52.203-7	-	Anti-Kickback Procedures (JUL 1995)
52-203-8	-	Cancellation, Rescission, And Recovery Of Funds For Illegal Or Improper Activity (JAN 1997)
52.203-10	-	Price Or Fee Adjustment For Illegal Or Improper Activity (JAN 1997)
52.203-12	-	Limitation On Payments To Influence Certain Federal Transactions (JUN 1997)
52.204-4	-	Printing/Copying Double-Sided On Recycled Paper (JUN 1996)
52.209-6	-	Protecting The Government's Interest When Subcontracting With Contractors Debarred, Suspended, Or Proposed For Debarment (JUL 1995)
52.211-15	-	Defense Priority and Allocation Requirements (SEP 1990)
52.215-2	-	Audit And Records-Negotiation (JUNE 1999)
52.215-8	-	Order of Precedence - Uniform Contract Format (OCT 1997)
52.215-14	-	Integrity of Unit Prices (OCT 1997)
52.215-15	-	Pension Adjustments And Asset Reversions (DEC 1998)
52.215-17	-	Waiver of Facilities Capital Cost of Money (OCT 1997) (*will be included if the successful offeror does not propose facilities capital cost of money)*
52.215-18	-	Reversion or Adjustment of Plans for Post-retirement Benefits (PRB) Other than Pensions (OCT 1997)
52.215-19	-	Notification of Ownership Changes (OCT 1997)
52.215-21	-	Requirements for Cost and Pricing Data or Information Other Than Cost or Pricing Data - Modifications (OCT 1997) - Alternate IV (OCT 1997)
52.216-7	-	Allowable Cost And Payment (APR 1998)
52.216-8	-	Fixed-Fee (MAR 1997)

52.219-4 - Notice of Price Evaluation Preference For HUBZone Small Business Concerns (JAN 1999) ☐ Offeror elects to waive the evaluation preference.
52.219-8 - Utilization Of Small Business Concerns (OCT 1999)
52.219-9 - Small Business Subcontracting Plan (OCT 1999) - Alternate II (JAN 1999)
52.219-16 - Liquidated Damages-Subcontracting Plan (JAN 1999)
52.219-25 - Small Disadvantaged Business Participation Program-Disadvantaged Status And Reporting (OCT 1999)
52.222-1 - Notice To The Government Of Labor Disputes (FEB 1997)
52.222-2 - Payment For Overtime Premiums (JUL 1990) -The Use Of Overtime Is Authorized Under This Contract If The Overtime Premium Does Not Exceed "0"
52.222-3 - Convict Labor (AUG 1996)
52.222-4 - Contract Work Hours And Safety Standards Act-Overtime Compensation (JUL 1995)
52.222-20 - Walsh-Healey Public Contracts Act (DEC 1996)
52.222-21 - Prohibition of Segregated Facilities (FEB 1999)
52.222-26 - Equal Opportunity (FEB 1999)
52.222-29 - Notification Of Visa Denial (APR 1984) (DEVIATION)

52.222-35 - Affirmative Action For Disabled Veterans And Veterans Of The Vietnam Era (APR 1998)
52.222-36 - Affirmative Action For Workers With Disabilities (JUN 1998)
52.222-37 - Employment Reports On Disabled Veterans And Veterans Of The Vietnam Era (APR 1998)
52.223-2 - Clean Air And Water (APR 1984)
52.223-3 - Hazardous Material Identification And Material Safety Data (JAN 1997)
52.223-5 - Pollution Prevention and Right-To-Know Information (APR 1998)
52.223-6 - Drug-Free Workplace (JAN 1997)
52.223-14 - Toxic Chemical Release Reporting (OCT 1996)
52.225-11 - Restrictions On Certain Foreign Purchases (AUG 1998)
52.226-1 - Utilization Of Indian Organizations And Indian-Owned Economic Enterprises (MAY 1999)
52.227-1 - Authorization And Consent (JUL 1995)- Alternate I (APR 1984)
52.227-2 - Notice And Assistance Regarding Patent And Copyright Infringement (AUG 1996)
52.227-10 - Filing of Patent Application- Classified Subject Matter (APR 1984)
52.227-11 - Patent Rights - Retention By The Contractor (Short Form) (JUN 1997)
(*will be included if the successful offeror is a small business or a non-profit organization)*
52.227-12 - Patent Rights - Retention By The Contractor (Long Form) (JAN 1997)
(*will be included if the successful offeror is not a small business or a non-profit organization)*
52.228-7 - Insurance - Liability To Third Persons (MAR 1996)
52.230-2 - Cost Accounting Standards (APR 1998)
52.230-3 - Disclosure And Consistency Of Cost Accounting Practices (APR 1998)
52.230-6 - Administration Of Cost Accounting Standards (NOV 1999)
52.232-9 - Limitation On Withholding Of Payments (APR 1984)
52.232-17 - Interest (JUN 1996)
52.232-18 - Availability Of Funds (APR 1984)
52.232-20 - Limitation Of Cost (APR 1984) *(Applicable when the contract or task order is fully*

funded)

52.232-22 - Limitation Of Funds (APR 1984) *(Applicable when the contract or task order is not fully funded)*
52.232-23 - Assignment Of Claims (JAN 1986) Alternate I (APR 1984)
52.232-25 - Prompt Payment (JUN 1997)
52.232-33 - Payment By Electronic Funds Transfer-Central Contractor Registration (MAY 1999)
52.233-1 - Disputes (DEC 1998) - Alternate I (DEC 1991)
52.233-3 - Protest After Award (AUG 1996) - Alternate I (JUN 1985)
52.237-2 - Protection Of Government Buildings, Equipment And Vegetation (APR 1984)
52.237-3 - Continuity Of Services (JAN 1991)
52.237-10 - Identification of Uncompensated Overtime (OCT 1997)
52.242-1 - Notice Of Intent To Disallow Costs (APR 1984)
52.242-3 - Penalties For Unallowable Costs (OCT 1995)
52.242-4 - Certification of Final Indirect Costs (JAN 1997)
52.242-13 - Bankruptcy (JUL 1995)
52.243-2 - Changes - Cost-Reimbursement (AUG 1987) - Alternate V (APR 1984)
52.243-6 - Change Order Accounting (APR 1984)
52.243-7 - Notification Of Changes (APR 1984)fill in 30
52.244-2 - Subcontracts (AUG 1998) - Alternate I (AUG 1998)
52.244-5 - Competition In Subcontracting (DEC 1996)
52.244-6 - Subcontracts for Commercial Items and Commercial Components (OCT 1998)
52.245-5 - Government Property (Cost-Reimbursement, Time-And-Material, Or Labor-Hour Contracts) (JAN 1986) (DEVIATION)
52.245-9 - Use And Charges (APR 1984) (DEVIATION)
52.245-18 - Special Test Equipment (FEB 1993)
52.245-19 - Government Property Furnished "As-Is" (APR 1984)
52.246-23 - Limitation Of Liability (FEB 1997)
52.246-25 - Limitation Of Liability - Services (FEB 1997)
52.247-1 - Commercial Bill Of Lading Notations (APR 1984)
52.247-63 - Preference For U. S. Flag Carriers (JAN 1997)
52.249-6 - Termination (Cost-Reimbursement) (SEP 1996)
52.249-14 - Excusable Delays (APR 1984)
52.251-1 - Government Supply Sources (APR 1984)
52.252-6 - Authorized Deviations in Clauses (APR 1984)(fill in Defense Federal Acquisition Regulation Supplement (48 CFR Chapter 2))
52.253-1 - Computer Generated Forms (JAN 1991)

b. DEPARTMENT OF DEFENSE FEDERAL ACQUISITION REGULATION CLAUSES

DFARS CLAUSE TITLE

252.201-7000 - Contracting Officer's Representative (DEC 1991)
252.203-7001 - Prohibition On Persons Convicted Of Fraud Or Other Defense Contract Related Felonies (MAR 1999)
252.203-7002 - Display Of DoD Hotline Poster (DEC 1991)
252.204-7000 - Disclosure Of Information (DEC 1991)
252.204-7003 - Control Of Government Personnel Work Product (APR 1992)
252.204-7004 - Required Central Contractor Registration (MAR 1998)

252.205-7000 - Provision Of Information To Cooperative Agreement Holders (DEC 1991)
252.209-7000 - Acquisition From Subcontractors Subject To On-Site Inspection Under The Intermediate-Range Nuclear Forces (INF) Treaty (NOV 1995)
252.209-7004 - Subcontracting With Firms That Are Owned Or Controlled By The Government Of A Terrorist Country (MAR 1998)
252.219-7003 - Small Business And Small Disadvantaged Business Subcontracting Plan (DoD Contracts) (APR 1996)
252.219-7004 - Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (Test Program) (JUN 1997)
252.223-7004 - Drug-Free Work Force (SEP 1988)
252.223-7006 - Prohibition On Storage And Disposal Of Toxic And Hazardous Materials (APR 1993)
252.225-7001 - Buy American Act And Balance Of Payments Program (MAR 1998)
252.225-7002 - Qualifying Country Sources As Subcontractors (DEC 1991)
252.225-7009 - Duty Free Entry- Qualifying Country Supplies (End Products and Components) (MAR 1998)
252.225-7010 - Duty Free Entry - Additional Provisions (MAR 1998)
252.225-7012 - Preference For Certain Domestic Commodities (MAY 1999)
252.225-7016 - Restriction On Acquisition Of Ball And Roller Bearings (AUG 1998)
252.225-7021 - Trade Agreements (MAR 1998)
252.225-7025 - Restriction On Acquisition Of Forgings (JUN 1997)
252.225-7026 - Reporting Of Contract Performance Outside The United States (MAR 1998)
252.225-7031 - Secondary Arab Boycott Of Israel (JUN 1992)
252.225-7043 - Antiterrorism/Force Protection Policy For Defense Contractors Outside The United States (JUN 1998) (fill in : Naval Criminal Investigative Service (NCIS), Code 24, telephone, DSN 228-9113 or commercial (202)433-9113)
252.227-7000 - Non Estoppel (OCT 1966)
252.227-7001 - Release Of Past Infringement (AUG 1984)
252.227-7013 - Rights In Technical Data -- Noncommercial Items (NOV 1995)
252.227-7014 - Rights In Noncommercial Computer Software And Noncommercial Computer Software Documentation (JUN 1995)
252.227-7016 - Rights In Bids or Proposal Information (JUN 1995)

252.227-7019 - Validation Of Asserted Restrictions--Computer Software (JUN 1995)
252.227-7025 - Limitations On The Use Or Disclosure Of Government-Furnished Information Marked With Restrictive Legends (JUN 1995)
252.227-7026 - Deferred Delivery Of Technical Data Or Computer Software (APR 1988)
252.227-7027 - Deferred Ordering Of Technical Data Or Computer Software (APR 1988)
252.227-7030 - Technical Data--Withholding Of Payment (OCT 1988)
252.227-7034 - Patents--Subcontracts (APR 1984)
252.227-7036 - Declaration Of Technical Data Conformity (JAN 1997)
252.227-7037 - Validation Of Restrictive Markings On Technical Data (SEP 1999)
252.227-7039 - Patents--Reporting of Subject Inventions (APR 1990)
252.231-7000 - Supplemental Cost Principles (DEC 1991)
252.235-7010 - Acknowledgment of Support and Disclaimer (MAY 1995)
252.235-7011 - Final Scientific Or Technical Report (SEP 1999)
252.242-7000 - Post Award Conference (DEC 1991)

252.242-7004 - Material Management And Accounting System (SEP 1996)
252.243-7002 - Requests for Equitable Adjustment (MAR 1998)
252.245-7001 - Reports of Government Property (MAY 1994)
252.246-7001 - Warranty Of Data (DEC 1991)
252.247-7023 - Transportation Of Supplies By Sea (NOV 1995)
252.247-7024 - Notification Of Transportation Of Supplies By Sea (NOV 1995)
(will be included if the successful offeror made a negative response to the inquiry at DFARS 252.247-7022)
252.251-7000 - Ordering From Government Supply Sources (MAY 1995)

I-2 FAR 52.223-11 - OZONE-DEPLETING SUBSTANCES (JUN 1996)

(a) Definitions.

“Ozone-depleting substance”, as used in this clause, means any substance designated as Class I by the Environmental Protection Agency (EPA) (40 CFR Part 82), including but not limited to chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform; or any substance designated as Class II by EPA (40 CFR Part 82), including but not limited to hydrochlorofluorocarbons.

(b) The Contractor shall label products which contain or are manufactured with ozone-depleting substances in the manner and to the extent required by 42 U.S.C. 7671j (b), (c), and (d) and 40 CFR Part 82, Subpart E, as follows:

"WARNING: Contains (or manufactured with, if applicable)_____*_____, a substance(s) which harm(s) public health and environment by destroying ozone in the upper atmosphere."

* The Contractor shall insert the name of the substance(s).

PART III - LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS
SECTION J
LIST OF ATTACHMENTS

J-1	Attachment (1) - Statement Of Work:	Pages 13
J-2	Workforce Qualifications and Experience	Pages 7

J-3 Exhibit A - DD Form 1423, Contract Data Requirements-3 Pages, Enclosure (1) - Instructions For Distribution- 1 Page, Enclosure (2) – Instructions for Monthly Cost and Performance Reporting Requirements - 1 Page, and Enclosure (3) – Specific Reporting Requirements for CDRLS A003 – A005, 2 Pages

J-4 Attachment (4) - ACCOUNTING AND APPROPRIATION DATA - 1 page.

PART IV - REPRESENTATIONS AND INSTRUCTIONS
SECTION - K
REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS OR RESPONDENTS

K-1 Representations, Certifications, and Other Statements of Offerors or Respondents

Each Offeror must submit a completed Representations, Certifications, and Other Statements Of Offerors or Respondents with its proposal which is available electronically in full text at http://heron.nrl.navy.mil/contracts/reps&certs.htm

K-2 FILL IN FOR FAR 52.219-1 - SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 1999)

The fill in information is as follows:

The standard industrial classification (SIC) code for this acquisition is_8731_.
The small business size standard is 500.

K-3 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING

The Offeror's CAGE Code is {fill-in}_____.
See DFARS 252.204-7001 in Section L for procedures on requesting a CAGE Code.

SECTION L
INSTRUCTIONS CONDITIONS AND NOTICES TO OFFERORS OR RESPONDENTS

L-1 52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

http://www.arnet.gov/far
http://heron.nrl.navy.mil/contracts/home.htm

FAR CLAUSE		TITLE
52.204-6	-	Data Universal Numbering System (DUNS) Number (JUNE 1999)
52.214-34	-	Submission Of Offers In The English Language (APR 1991)
52.214-35	-	Submission Of Offers In U.S. Currency (APR 1991)
52.215-1	-	Instructions to Offerors- Competitive Acquisition (OCT 1997)
52.215-16	-	Facilities Capital Cost Of Money (OCT 1997)
52.219-24	-	Small Disadvantaged Business Participation Program – Targets (JAN 1999)
52.222-24	-	Preaward On-Site Equal Opportunity Compliance Evaluation (FEB 1999)
52.252-5	-	Authorized Deviations in Provisions (APR 1984)
252.204-7001	-	Commercial and Government Entity (CAGE) Code Reporting (AUG 1999)

L-2 FAR 52.211-14 - NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be a ☐ DX rated order; ☐ DO rated order certified for national use under the Defense Priorities and Allocations system (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation.

L-3 FAR 52.215-20 REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA (OCT 1997)ALTERNATE IV (OCT 1997)

(a) Submission of cost or pricing data is not required.

(b) Provide information described below : The Offeror shall provide information as required in Section L.11.C of this solicitation.

L-4 FAR 52.216-1 - TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a Cost Plus Fixed Fee Research and Development Term-type Contract resulting from this solicitation.

L-5 FAR 52.233-2 - SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in Section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO) shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from the Control Desk, Code 3200, Bldg. 222, Rm. 115, Naval Research Laboratory, 4555 Overlook Ave., S.W., Washington DC 20375-5326.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

L-6 DFARS 252.227-7017 - IDENTIFICATION AND ASSERTION OF USE, RELEASE, OR DISCLOSURE RESTRICTIONS (JUN 1995)

(a) The terms used in this provision are defined in following clause or clauses contained in this solicitation--
  (1) If a successful offeror will be required to deliver technical data, the Rights in Technical Data--Noncommercial Items clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data and Computer Software--Small Business Innovative Research (SBIR) Program clause.
  (2) If a successful offeror will not be required to deliver technical data, the Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data and Computer Software--Small Business Innovative Research (SBIR) Program clause.

(b) The identification and assertion requirements in this provision apply only to technical data, including computer software documents, or computer software to be delivered with other than unlimited rights. For contracts to be awarded under the Small Business Innovative Research Program, the notification requirements do not apply to technical data or computer software that will be generated under the resulting contract. Notification and identification is not required for restrictions based solely on copyright.

(c) Offers submitted in response to this solicitation shall identify, to the extent known at the time an offer is submitted to the Government, the technical data or computer software that the Offeror, its subcontractors or suppliers, or potential subcontractors or suppliers, assert should be furnished to the Government with restrictions on use, release, or disclosure.

(d) The Offeror's assertions, including the assertions of its subcontractors or suppliers or potential subcontractors or suppliers shall be submitted as an attachment to its offer in the following format, dated and signed by an official authorized to contractually obligate the Offeror:
Identification and Assertion of Restrictions on the Government's Use, Release, or Disclosure of Technical Data or Computer Software.
The Offeror asserts for itself, or the persons identified below, that the Government's rights to use, release, or disclose the following technical data or computer software should be restricted:

Technical Data or Computer Software to be Furnished With Restrictions*	Basis for Assertion**	Asserted Rights Category***	Name of Person Asserting Restrictions****

(LIST)*****. (LIST) (LIST) (LIST)

* For technical data (other than computer software documentation) pertaining to items, components, or processes developed at private expense, identify both the deliverable technical data and each such items, component, or process. For computer software or computer software documentation identify the software or documentation.

** Generally, development at private expense, either exclusively or partially, is the only basis for asserting restrictions. For technical data, other than computer software documentation, development refers to development of the item, component, or process to which the data pertain. The Government's rights in computer software documentation generally may not be restricted. For computer software, development refers to the software. Indicate whether development was accomplished exclusively or partially at private expense. If development was not accomplished at private expense, or for computer software documentation, enter the specific basis for asserting restrictions.

*** Enter asserted rights category (e.g., government purpose license rights from a prior contract, rights in SBIR data generated under another contract, limited, restricted, or government purpose rights under this or a prior contract, or specially negotiated licenses).

**** Corporation, individual, or other person, as appropriate.

***** Enter "none" when all data or software will be submitted without restrictions.

Date _____

Printed Name and Title _____

_____

Signature _____

(End of identification and assertion)

(e) An offeror's failure to submit, complete, or sign the notification and identification required by paragraph (d) of this provision with its offer may render the offer ineligible for award.

(f) If the Offeror is awarded a contract, the assertions identified in paragraph (d) of this provision shall be listed in an attachment to that contract. Upon request by the Contracting Officer, the Offeror shall provide sufficient information to enable the Contracting Officer to evaluate any listed assertion.

L-7 DFARS 252.227-7028 - TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY DELIVERED TO THE GOVERNMENT (JUN 1995)

The Offeror shall attach to its offer an identification of all documents or other media incorporating technical data or computer software it intends to deliver under this contract with other than unlimited rights that are identical or substantially similar to documents or other media that the Offeror has produced for, delivered to, or is obligated to deliver to the Government under any contract or subcontract. The attachment shall identify - -

(a) The contract number under which the data or software were produced;

(b) The contract number under which, and the name and address of the organization to whom, the data or software were most recently delivered or will be delivered; and

(c) Any limitations on the Government's rights to use or disclose the data or software, including, when applicable, identification of the earliest date the limitations expire.

L-8 GOVERNMENT-FURNISHED PROPERTY

No material, labor, or facilities will be furnished by the Government unless provided for in the solicitation.

L-9 INQUIRIES CONCERNING THE RFP

Any questions concerning the RFP must be submitted in writing to the Contracting Officer at the location noted in blocks 7 and 9 of the Standard Form 33, "Solicitation, Offer and Award," no less than fifteen (15) days before closing. The Government will not consider questions received after this date. Offerors are cautioned against directing any questions concerning this RFP to technical personnel at the Naval Research Laboratory.

L-10 INSTRUCTIONS FOR SUBMISSION AND INFORMATION REQUIRED TO EVALUATE PROPOSALS

(1) Information for the technical/management proposal shall be placed in Volume I and be completely separate from the business proposal (Volume II).

(2) Proposal Identification/Mailing - The proposal should be packaged for delivery so as to permit safe and timely arrival at destination. The proposal package should be sent to the address shown in Block 7 of the RFP face page and marked:

Solicitation No. N00173-00-R-RS01
Closing Date:
(As specified in Block 9, RFP face page)
Attn: Code 3235:RDS

(3) Proposal Format and Length - No attempt is made to restrict the proposal format and style. However, the proposal should be written and organized so as to be compatible with the RFP, the Statement of Work, company's organization and accounting structure, and proposed cost estimate. Offerors are encouraged to use recycled paper and maximize the use of double sided copying when preparing responses to solicitations.

L.11.B VOLUME I - TECHNICAL/MANAGEMENT PROPOSAL

GENERAL PROPOSAL CONTENT:

Offerors are required to furnish an original and four copies of a detailed TECHNICAL PROPOSAL with sufficient detail to show compliance with the requirements stated in each subparagraph of Section C of this solicitation. Specific cost or pricing details shall be omitted from the Technical Proposal.

The technical proposal shall include any drawings, including schematic drawings, which will enable independent technical evaluation of the proposal.

The technical proposal shall clearly and concisely identify and discuss the Offeror’s technical and

managerial qualifications and approaches to accomplishing the requirements outlined in Section C.

The technical proposal shall be subdivided into a "Proposal Summary" section, a "Workforce Qualifications and Experience" section, a "Technical Approach" section, a "Corporate Resources and Organizational Capabilities" section, and a "Corporate Past Performance Information" section in that order.

The technical proposal shall also contain responses to each of the individual requirements listed in **Section C.3.1 – C.3.7** of Attachment 1, Attachment 2, and Attachment 3. Each response shall furnish the Government with sufficient detail to enable the technical evaluation panel to independently evaluate each response against the respective Government requirement as stated in Section C and Section M.

L.11.B.1 PROPOSAL SUMMARY

The proposal summary is an unevaluated requirement. The Offeror shall provide a concise summary, exclusive of cost information, of its proposal. This summary should be complete, stand on its own, and provide executive level reviewers with an understanding of the content of the proposal. The summary should summarize the highlights, plans and qualifications contained in the body of the technical proposal.

L.11.B.2 WORK FORCE QUALIFICATION AND EXPERIENCE

The Offeror shall document the experience, education, and other qualifications of all personnel proposed to accomplish the technical requirements stated in Section C of this solicitation. As a minimum, the Offeror shall provide the following information for each proposed individual: (a) name of proposed personnel; (b) proposed labor category, as designated in Attachment 2; (c) proposed Task areas of involvement, as identified in Attachment 1; (d) educational qualifications; (e) technical or managerial qualifications and experience as they relate to the Statement of Work and the requirements in Attachment 2; (f) length of experience; and (g) previous work history. Key Personnel shall be identified as such.

In addition to the requirements stated above, the Offeror shall (a) describe their plan to retain key personnel throughout the term of any resulting contract, (b) demonstrate their ability to attract additional trained personnel, and (c) describe their strategy for and ability to respond to surges in effort.

L.11.B.3 MANAGERIAL APPROACH

Pursuant to this requirement, the Offeror shall provide a managerial plan to demonstrate its capability to efficiently, effectively and economically plan, organize, manage, coordinate and control the work effort required under this solicitation. The Offeror's managerial plan shall address its approach for tracking milestones, costs, subcontractor efforts (if applicable) and deliverables. The Offeror's managerial plan shall also address its proposed internal procedures for assuring timely responses to the Government's research needs on any resulting contract.

L.11.B.4 CORPORATE RESOURCES AND ORGANIZATIONAL CAPABILITIES

The Offeror shall describe and document those resources which the firm will make available to this

project, including, but not limited to, (a) financial resources, (b) research, development and production facilities and equipment, and (c) any other technical resources offered to meet the Government's requirements as stated in Section C of this solicitation.

The Offeror shall document the firm's experience on similar or related projects through narrative descriptions of these experiences. Prior and current program experience should be identified in these narratives by citing contract numbers, contracting agencies or firms, the COR's name and telephone number, the applicable period of performance, and a summary of the nature of the work. The narratives should show the clear relationship of previous work to the requirements of this project.

The Offeror shall demonstrate its capacity to routinely and rapidly respond to the requirements stated in Attachment 1 to this solicitation by providing specific examples drawn from the previous five years of operations.

L.11.B.5 CORPORATE PAST PERFORMANCE INFORMATION

(i) Offerors shall submit the following information as part of their proposal. (Offerors are encouraged to submit the information prior to other parts of the proposal to assist the Government in reducing the length of the evaluation period.) List the last five contracts or subcontracts completed during the past three years for supplies or services similar in nature to this requirement. Include in the five any current contract or subcontracts for similar supplies/services that were awarded at least one year prior to the date of this solicitation. Offerors that have no similar previous or current contracts should provide the requested information for proposed subcontractors that will perform major or critical aspects of the requirement of for the proposed project manager or key personnel responsible for major or critical aspects of the requirement.

1. Name of contracting organization
2. Contract number
3. Contract type
4. Total Contract Value
5. Description of the contract work
6. Contracting Officer and telephone number
7. Contracting officer's representative, program manager, or similar Official and telephone number

(ii) Offerors shall contact the contracting organizations identified pursuant to paragraph (a) as soon as possible and request them to send past performance information on the identified contracts to the address in Block 7 of the face page of this solicitation. The past performance report, which is available at http://heron.nrl.navy.mil/contracts/home.htm is to be provided to the contracting organization for this purpose. If the contracting organization has already collected past performance information on the contract pursuant to FAR Subpart 42.15, the format used to collect the information may be used instead of the past performance report.

(iii) Offerors may include in their proposals specific information relating to problems encountered in performing the identified contracts and any corrective actions by the offeror. Offerors should not provide general information on their performance on the identified contracts as this will be obtained from the contracting organizations.

L.11.C VOLUME II - BUSINESS PROPOSAL

REQUIRED COPIES: 1 ORIGINAL AND 4 COPIES

The Offeror shall submit a Cost/Pricing Proposal, which shall include such explanatory data as is necessary to establish that proposed costs are reasonable, allocable, appropriate and allowable pursuant to both Part 31 of the Federal Acquisition Regulation (FAR) and Part 231 of the Defense Federal Acquisition Regulation Supplement (DFARS). More specifically, the Cost/Pricing proposals shall provide the following information:

(a) (i) Labor to include categories of labor, individuals proposed within each category; hours proposed for each individual, and hourly rate for each individual;
(ii) Indirect or Overhead Rate(s);
(iii) Any Direct Materials proposed;
(iv) Any Other Direct Costs proposed;
(v) General and Administrative Rate(s);
(vi) Facilities Capital Cost of Money Rate(s);
(vii) Any other applicable rates;
(viii) Other supporting costs;
(ix) Fee

(b) Any information reasonably required to explain the Offeror's estimating process, including mathematical algorithms and judgmental factors used in formulating the estimate; and any contingency assumptions employed in arriving at the proposed price

(c) Consultants/Subcontractors: Offerors shall describe subcontracting arrangements proposed for completing the work required herein. Sub-Contractors shall be identified as well as the portion of the work to be subcontracted. Documents establishing a subcontracting relationship shall be submitted with the cost proposal. Offerors may arrange for proposed subcontractors to submit supporting cost data directly to the Government. Any such submission shall not be deemed to establish privity of contract between the Government and the proposed sub-contractor. With respect to Independent Contractors or Consultants, the Offeror shall document direct labor rates proposed by providing the Government with copies of either letters of intent or Consultant or Independent Contractor Agreements executed between the Offeror and the Independent Contractor. Offerors who intend to include subcontracted effort as part of their proposal are responsible for ensuring that complete information as described above is provided from each subcontractor as part of their response to this solicitation.

(d) Material and Travel: FOR PROPOSAL PURPOSES ONLY, Offerors will use the following estimates (with applicable indirect costs added to the estimate) for required material and travel costs. If subcontractors propose material or travel costs, these must also be burdened and that burden added to the estimates.

(i) The "Material" estimate of $200,000.00 for the base year and $200,000.00 for each of the four option years includes those directly associated items which are expected to be incorporated into end products or expended during performance and minor direct equipment expense.

(ii) The "Travel" estimate of $50,000.00 for the base year and $50,000.00 for each of the four option years included in the period of performance includes travel and subsistence for work at alternative sites, and for allowable local travel per the Joint Travel Regulations.

L-12 MULTIPLE AWARDS

The Contracting Officer may make multiple awards resulting from this solicitation.

SECTION M
EVALUATION FACTORS FOR AWARD

M-1 EVALUATION

Award will be made to that responsible offeror whose proposal is determined to be the best value to the Government, proposed cost and other factors considered. The Government reserves the right to make award to other than the low offeror. Although technical considerations are more important than cost, the closer the technical scores of the various proposals are to one another, the more important cost considerations become.

M-2 EVALUATION FACTORS FOR AWARD

Proposals received in response to this solicitation will be evaluated in accordance with the criteria stated in Sections L.11.B(2), L.11.B(3), L.11.B(4), and L.11.B(5) which together compromise the Technical Category; and Section L.11.(C), which comprises the Cost/Pricing category.

M-2-1 – TECHNICAL CATEGORY

The technical evaluation will consider the Offeror's overall approach to, understanding of, and capability to adequately perform and provide the requirements listed in the Statement of Work, as reflected in the Offeror's responses to the evaluation criteria listed in Sections L.11.B.2, L.11.B.3, L.11.B.4, and L.11.B.5. Technical scores will be based on evaluative determinations of whether the Offeror's proposal meets, does not meet, or, as proposed, will provide a better value than the Government's minimum requirements. Pursuant to FAR 15.306(c), proposals which are found to contain unrealistic technical or schedule terms, which fail to comply with the requirements stated in this RFP, or which are found to be unrealistically high or low in cost/price, may be significantly downgraded or removed from further consideration. Areas within the Offeror's technical proposal which are found to offer unique or innovative technical solutions or effort beyond the Government's anticipations as stated in Attachment 1 may receive maximum technical scores.

Evaluated Components within the Technical area include "Workforce Qualifications and Experience", "Managerial Approach", "Corporate Resources and Organizational Capabilities" and "Corporate Past Performance Information". Within the Technical category, the component "Workforce Qualifications and Experience" is weighted significantly higher than the components "Corporate Resources and Organizational Capabilities", "Corporate Past Performance Information", and "Managerial Approach", all of which are weighted equally

Past Performance – Past performance will be evaluated on the basis of quality of work performed, timeliness of performance, cost control, and business relations. The evaluation will be based on the information provided pursuant to Contract Section L.11.B.(4) and other sources, if available. Offerors that have no relevant performance history or for which past performance information is not available will not be evaluated favorably or unfavorably on past performance. The Government may begin proposal evaluation prior to receipt of past performance information. If, after completion of proposal evaluation

except evaluation of past performance, the contracting officer determines that evaluation of past performance will not affect the outcome of competitive selection, the contracting officer may waive its evaluation in accordance with FAR 15.304(c)(3)(iii).

M-2-2 COST TO THE GOVERNMENT

Proposed estimated cost to the Government. The Government may adjust the proposed cost for purposes of evaluation based upon the findings of a cost realism analysis. Cost Realism means that the costs in an offeror's proposal represent the most-probable cost; are realistic for the work to be performed; reflect a clear understanding of the requirements; and are consistent with the various elements of the offeror's technical proposal. The cost realism evaluation includes (a) an analysis of the adequacy of the hours, labor mix, and other direct costs to perform the work as proposed in the technical proposal as well as the proposed labor and indirect rates; (b) an analysis of costs proposed for travel, materials, consultants and subcontractors, facility capital cost of money, and fee; and (c) an evaluation of the likelihood that the risks inherent in the offeror's technical approach will result in higher actual costs than anticipated.

M-3 FAR 52.217-5 - EVALUATION OF OPTIONS (JUL 1990)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

ATTACHMENT 1
SECTION C:
STATEMENT OF WORK :
SPACE SCIENCE RESEARCH, DEVELOPMENT AND ENGINEERING EFFORTS

C.1. BACKGROUND

The Naval Research Laboratory conducts research in the fields of astronomy and astrophysics, solar-terrestrial physics and atmospheric science. Satellites, rockets and ground-based facilities are used (a) to obtain information on radiation from the sun and celestial sources, (b) to study the behavior of the ionosphere and the upper and lower atmosphere, and (c) to conduct research in support of these activities. Radio telescopes are used for astronomical observations and atmospheric sensing. Results are of importance to radio communications radio communications applicable to (a) the operation of ships and aircraft, (b) utilization of the space environment, and (c) fundamental understanding of natural radiation and geophysical phenomena.

In order to carry out space science investigations, instrument systems engineering efforts are needed for satellite design, experiment design, instrument packaging, integration and payload testing. Specific issues to be addressed under this solicitation will include advanced thermal, mechanism, optical, contamination and systems engineering activities for implementation of Space Science instruments and payloads.

C.2: SCOPE

The purpose of the contract is to acquire the personnel, equipment and facilities necessary to perform instrument systems engineering efforts pursuant to the design, development, analysis, fabrication, assembly, integration, testing and documentation of sophisticated Space Science instruments and experimental payloads.

More specifically, the work required under this solicitation primarily deals with advanced thermal, mechanism, optical, contamination and systems engineering efforts which shall, at least, include the following functions:

Thermal Systems Engineering
Contamination Engineering
Instrument Optical and RF Engineering
Instrument Systems Engineering
Mechanisms Engineering
Mechanical Systems Engineering
Electrical Systems Engineering
Hardware Fabrication and Testing, Inspection, Assembly, and Integration

C.3 SPECIFIC REQUIREMENTS

3.0 OVERALL

The Contractor shall provide the personnel, facilities and materials to perform research, development and engineering efforts for the Space Sciences Division. Primary areas of concern under this solicitation include, but may not be limited to, advanced thermal, mechanism, optical, contamination and systems engineering. Tasks to be performed under this Statement of Work include, but may not be limited to (a) performance of instrument and experimental payload studies, design, analysis, integration and testing in the areas of advanced thermal, mechanism, optical, contamination, and systems engineering; (b) instrument prototype and flight hardware fabrication, (c) hardware assembly, (d) training, and (e) documentation development. All tasks hereunder will require in-depth knowledge and understanding of, and experience with instrument, payload and spacecraft systems, as well as the equipment and procedures involved in launching these systems on ELV and STS vehicles.

C.3.1 TASK 1 – ADVANCED THERMAL SYSTEMS ENGINEERING

The Contractor shall perform efforts associated with advanced thermal systems. Efforts associated with this task shall include the following:

C.3.1.1 Sub-Task 1.1 – Thermal Systems Engineering

The Contractor shall perform thermal systems engineering efforts that include, but may not be limited to, detailed thermal systems design, analysis, testing and integration efforts at the board, box, instrument, and payload levels, including (a) temperature gradient prediction/control; (b) electronic packaging analysis; (c) bulk temperature/transient response/aerodynamic heating predictions; and (d) state of the art instrument cooling systems design, fabrication and testing.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.1.2 Sub-Task 1.2 – Thermal System Design and Analyses

The Contractor shall (a) conceive and develop thermal system designs for instruments and payloads; (b) determine thermal interfaces between instruments and their support structure; (c) develop plans and procedures, as applicable, for thermal analyses and verification testing; and (d) review, evaluate, analyze, and report on thermal system design implementation and development.

The Contractor shall (a) perform thermal analyses for STS and ELV instrument payloads; (b) develop analytical mathematical models representing conductive and radiative heat transfer both internal and external to the payload; (c) determine heat fluxes, temperature distributions, and gradients for all specified payload components and locations for all flight and on-orbit conditions.

The Contractor shall also improve or modify existing thermal software, as required. All thermal analysis software utilized under this Contractor shall be functionally and operationally compatible with Systems Improved Numerical Differencing Analyzer (SINDA), and either Thermal Radiation Analyzer System (TRASYS) or Thermal Synthesizer System (TSS) software packages, as required by the COR.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Items A003 and A004.

C.3.1.3 Sub-Task 1.3 – Advanced Thermal System Development, Integration and Testing

The Contractor shall develop, integrate and test advanced thermal system technologies to facilitate new Space Science Division missions and applications. Technologies included under this subtask shall include, but may not be limited to (a) Capillary Pumped Loops, (b) heat pipes, (c) heat pumps, (d) alternative materials, and other similar technologies and thermal coatings

The Contractor shall perform thermal coating efforts in the areas of (a) thin film analysis, (b) thermal/optical testing, and (c) environmental testing of instrument, payload and spacecraft coatings.

The Contractor shall use project requirements to determine planned usage of thermal control coatings and the extent of environmental testing needed.

The Contractor shall perform efforts associated with conducting (a) solar wind testing, (b) UV degradation testing, and (c) conductivity testing of coatings.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.1.4 Sub-Task 1.4 – Thin Films and Thermal Coatings Application

The Contractor shall (a) apply instrument, payload and spacecraft coatings which meet thermal and contamination requirements; (b) devise methods of surface preparation and application procedures for such sprayed thermal control coatings as silicate, silicon and urethane-based coatings; and (c) devise techniques for the refurbishment and cleaning of coatings to remove particulate contamination.

The Contractor shall also perform efforts in the areas of vacuum vapor deposition and sputter deposited thin films.

C.3.2 TASK 2 – CONTAMINATION ENGINEERING

The Contractor shall provide contamination control management and analyses to define and implement appropriate contamination control performance measures pursuant to mission requirements.

C.3.2.1 Sub-Task 2.1 – Contamination Control Management

The Contractor shall (a) develop contamination control plans for instruments, payloads and related spacecraft; (b) determine contamination control requirements; and (c) develop appropriate monitoring plans and procedures to assess contamination control requirements compliance. The Contractor shall also monitor, review, evaluate, analyze, and report on overall contamination control management implementation and development.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.2.2 Sub-Task 2.2 – Contamination Control Analysis

The Contractor shall (a) develop analytical transport models (molecular and particulate, as applicable) for instrument systems and other spaceflight hardware; and (b) generate contamination hazards predictions. The Contractor shall perform detailed environmental analyses of all phases of assembly, integration, test, transportation, pre-launch, on-orbit, and descent for comparison against requirements. The Contractor shall establish surface contamination limits based on allowable performance degradation and conduct tradeoff analyses on specifications and reviewing requirements. The Contractor shall also develop new, or improve existing, contamination control analysis software.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Items A003 and A004.

C.3.3 TASK 3 – INSTRUMENT OPTICAL/RF ENGINEERING

Under this Task, the Contractor shall perform efforts which shall include, but may not be limited to, (a) ray trace, (b) optics design, (c) STOP analysis, (d) MW receiver design/analysis, and (e) design, fabrication and testing of optical benches and stray light baffles/doors.

C.3.3.1 Sub-Task 3.1 – Instrument Optical Design and Development

The Contractor shall perform optical design and analysis efforts to provide (a) concept trades, (b) concept design, (c) component design, (d) 1st order baffle design, (e) optical mounting concepts, (f) optical packaging, (g) alignment and fabrication tolerancing, and (h) development of component specifications for engineering drawings.

The Contractor shall perform optical research and development efforts involving prototype laboratory optical hardware, new optical algorithms for use in software codes, and novel optical designs and analysis techniques.

The Contractor shall interface with and make optical recommendations to instrument teams, science principal investigators, and project managers.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.3.2 Sub-Task 3.2 – Instrument Optical and RF Analysis

The Contractor shall perform optical, opto-mechanical, electro-optical, and RF analysis efforts at the conceptual, preliminary, and detailed stages of instrument and payload programs. The required efforts may be directed to the following topics: (a) adaptive optics, (b) geometrical and physical optics, (c) deformed optics, (d) diffraction, (e) Gaussian beam propagation, (f) stray light/energy analysis, (g) interferometry, (h) component tolerancing and tolerancing sensitivity, (i) radiometry as associated with receivers, detectors and detector arrays, (j) geometrical and diffraction image quality, (k) throughput, (l) polarization, (m) alignment and calibration, and (n) guided wave optics.

The Contractor shall provide the personnel and facilities necessary to participate in the optical analysis aspects of an interdisciplinary Structural – Thermal – Optical (STOP) analysis task. The efforts associated with this task shall include (a) conceiving physical transformations, (b) implementing coordinate transformations, and (c) developing the interface tools (macros, etc.) to accomplish this. The Contractor shall perform subsystem, instrument and spacecraft analysis of system behavior and system error budgets and tolerances. The Contractor shall also establish component tolerances based on allowable tolerance sensitivities, performance degradation, and error budgets.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.4 TASK 4 – INSTRUMENT SYSTEMS ENGINEERING

The Contractor shall perform studies and analyses which shall include, but may not be limited to (a) feasibility studies, (b) design/reviews, (c) margin/budget management, (d) specifications, (d) interfaces, (e) parts engineering, and (f) contamination control. These tasks require the use of a comprehensive suite of modeling, design and analysis tools, including structural/thermal/optical (STOP) analysis capability.

C.3.4.1 Sub-Task 4.1 – Alignment and Pointing Studies

The Contractor shall (a) perform three-dimensional kinematics analyses; (b) perform field view analyses to determine structural/optical interferences; (c) perform collision detection analysis to determine any mechanism interferences; (d) provide realistic visualization of such simulations as required; (e) generate programs and recordings of such simulations for integration with other hardware and software as needed.

The Contractor shall perform studies that combine the influence of thermal environments, gravity, loading/unloading, tolerances, and structural stiffness effects on the alignment and pointing of instrument,

payload and spacecraft systems, mechanisms, electromechanical devices, and instruments. Studies shall include STOP analyses. The Contractor shall also (a) evaluate the capabilities of alignment test facilities, (b) monitor tests, and (c) reduce test data.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.4.2 Sub-Task 4.2 – Configuration and Systems Requirements Trade Studies

The Contractor shall perform configuration trade-off studies on instrument, payload and related spacecraft, mechanisms, and scientific instruments in launch, orbital, and landing conditions.

The Contractor shall perform studies which define (a) instrument and payload mechanical system requirements, (b) mass budgets, (c) error budgets, (d) system/subsystem requirements, (e) ground support equipment requirements, and (f) integration and test requirements.

The Contractor shall perform radiometric system studies that include the influence of optical, electro-optical, thermal, electronic, and component tolerances on radiometric error budgets.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.4.3 Sub-Task 4.3 – Sub-System Engineering Review and Analysis

The Contractor shall review, evaluate, analyze, and prepare (a) mechanical design interfaces, and (b) mechanical design specifications for instrument and payload interfaces. The Contractor shall review, evaluate, and augment (a) math models, (b) structural analyses, (c) fracture control implementation, (d) thermal analyses, and (e) alignment studies. The Contractor shall participate in design reviews of structural subsystems and instruments. The Contractor shall review, analyze, and develop test plans for subsystems and instruments. The Contractor shall analyze test data and recommend appropriate modifications to hardware, math models, and test specifications or set-ups.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.4.4 Sub-Task 4.4 – Instrument Related Attitude and Control Design and Analyses

The Contractor shall perform attitude control system definition, evaluation and implementation studies which shall include, but may not be limited to, incorporating the structural transfer function into the attitude and control system design, in order to analyze the effects of structural modes on control system performance and error budgets which affect the instruments and payloads.

C.3.4.5 Sub-Task 4.5 – Instrument Mission Operations and Planning

The Contractor shall perform efforts associated with instrument mission operations and planning, which shall include, but may not be limited to, (a) on-orbit instrument activation and engineering check-out, (b) spacecraft Delta-V maneuver plan and procedure development implementation, (c) instrument-related flight software update requirement definition, (d) impact review and verification, (e) operations management, (f) spacecraft subsystem performance evaluation, (g) assessment and reporting, (h) instrument and payload longevity assessment and prediction, (i) configuration management, (j) contingency planning efforts, (k) long-term instrument, payload and spacecraft component performance trending, (l) contingency procedure development, (m) special operational studies, (n) pre-launch efforts, (o) on-orbit ACS sensor calibration, (p) instrument, payload and spacecraft anomaly resolution and recovery implementation, and (q) general operational mission efforts.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.5 TASK 5 – MECHANISMS ENGINEERING

Pursuant to this task, the Contractor shall perform trade studies, analysis and development of detailed mechanisms to support instrument and experimental payload programs. The efforts associated with this task shall include the design, modeling, analysis, development, fabrication, testing and alignment of such precision mechanisms as (a) electromechanical devices, (b) release mechanisms, (c) shutters, (d) choppers, and (e) deployment mechanisms and booms.

C.3.5.1 Sub-Task 5.1 – Design and Analysis

The Contractor shall conceive, analyze, design, develop, direct, test, and provide the required mechanical, optomechanical, electromechanical, electrical, and electronic expertise to support the development of electromechanical components and systems for flight instruments and spacecraft subsystems.

The Contractor shall analyze, design, fabricate, test, and integrate precision electromechanical systems for scanning, pointing, and tracking applications. This subtask shall include development of state of the art electronic systems to control the mechanisms.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.5.2 Sub-Task 5.2 – Development, Integration and Testing

The Contractor shall verify the performance of electromechanical components and systems such as optical benches, telescopes, collimators, and antenna booms through all the stages of development from conceptual design to on-orbit testing.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.6 TASK 6 – MECHANICAL SYSTEMS ENGINEERING

Pursuant to this task, the Contractor shall perform trade studies and detailed structural and mechanical design efforts associated with instrument and experimental payload programs. The efforts associated with this task shall include the design, modeling, analysis, development, fabrication, testing and alignment of precision structures, mechanical interfaces/enclosures, and mechanisms.

C.3.6.1 Sub-Task 6.1 – Finite Element Model Analysis

The Contractor shall generate finite element models (FEMs) of instrument and payload spaceflight and related structures with primary emphasis given to the use of the NASTRAN structural analysis program. The Contractor shall utilize FEM pre- and post-processor software to aid in the development/modification, checkout and visualization of the NASTRAN models themselves, as well as the FEM analysis results.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.6.2 Sub-Task 6.2 – ELV and STS Flight Loads Analyses

The Contractor shall perform preliminary or design-coupled launch vehicle/payload flight loads analyses on task specified payload configurations. Flight loads analyses include (a) lift-off, ascent, descent, and landing for STS, and (b) launch and ascent for Expendable Launch Vehicles (ELV). The purpose of these analyses may be (a) to determine envelope preliminary design loads, or (b) to determine payload specific time-history transient flight loads. Loads parameters required may be acceleration, displacement, force, or stress.

The Contractor shall perform preliminary coupled STS/payload on-orbit loads analyses on task specified payloads configurations. The Contractor shall determine (a) loads resulting from berthing of payloads to carrier structures in the orbiter cargo bay, and (b) loads due to orbiter OMS and RCS firings while the payload is berthed. Load parameters required will include acceleration, displacement, force and stress.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.6.3 Sub-Task 6.3 – Stress Analysis

The Contractor shall perform hardware-related stress and margin of safety analyses of instrument and payload structures, electromechanical devices, and mechanisms. The purpose of these analyses will be

(a) to size the required structural members to obtain the required strength and stiffness characteristics, and (b) to demonstrate required stress margins of safety. This sub-task is a necessary prerequisite for fracture control implementation using safe-life (fracture mechanics analysis) and fail-safe approaches.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.6.4 Sub-Task 6.4 – Dynamic Analysis

The Contractor shall perform selected vibration, frequency response, and vibroacoustic analyses to simulate spacecraft test and the flight event responses of instruments, payload structures, electromechanical devices and mechanisms. The required analyses shall determine the acceleration, velocity, displacement, and force response of the hardware due to random, transient, sinusoidal vibration, and acoustic environments. The Contractor shall derive equivalent test specifications from the required analyses which properly simulate dynamic flight environments.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.6.5 Sub-Task 6.5 – Fracture Control

The Contractor shall develop fracture control plans for task-specified STS payloads, and shall implement approved fracture control procedures. The Contractor shall perform fracture mechanics analyses to ensure that the maximum crack size which can exist in structural elements, as determined by NDI test procedures, will not propagate to failure as a result of intended service usage. The Contractor shall perform fail-safe and containment analyses, where appropriate, to satisfy fracture control requirements. The Contractor shall also perform STS safety reviews for specific payloads, as specified in task assignments.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.6.6 Sub-Task 6.6 – Mechanical Design

The Contractor shall (a) conduct conceptual and detailed mechanical design studies. (b) produce configuration layout drawings, and (c) iterate these arrangement drawings, as necessary, to satisfy mission objectives. The Contractor shall also provide conceptual designs and drawings of instruments, payload and spacecraft structures, GSE, and mechanisms (i.e., deployable booms, choppers, shutter mechanisms, aperture doors, etc.) The Contractor shall produce layout and detail fabrication drawings of all hardware mentioned above in both conventional board and Computer Aided Design (CAD) formats.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.6.7 Sub-Task 6.7 – Mechanical Drawing Checking

The Contractor shall perform detailed mechanical drawing checking in accordance with ANSI Y14.5M, Dimensioning and Tolerancing.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.7 TASK 7 – ELECTRICAL SYSTEMS ENGINEERING

Pursuant to this task, the Contractor shall design, model, analyze, assemble, integrate and test instrument control and data storage subsystems. The subsystems associated with this task shall include, as a minimum, servo-controllers, electronic thermostats, and processing and memory systems.

C.3.7.1 Sub-Task 7.1 – Electrical Systems and Control

The Contractor shall conduct conceptual and detailed analytical studies for the design, optimization, and performance verification of both control systems for ground support and spaceborne thermal, mechanical, electromechanical and electronic systems. Requirements under this subtask shall include (a) the modeling of mechanical systems to produce the required transfer functions between actuators and sensors for analysis of the control system, and (b) development of transfer functions for thermal and electronics.

Further requirements under this subtask shall include, but may not be limited to, (a) analysis, design, and specification of actuators and sensors to allow feedback control systems to meet the performance specifications within imposed environmental and dimensional constraints; (b) use of classical and modern techniques in the analysis and synthesis of steady state and transient behavior of linear and nonlinear feedback systems; (c) computer processing of test data for analysis and verification of the system's performance and the extraction of control system model parameters; (d) estimation of the system's performance margins, sensitivity to parameter variations and performance in the presence of disturbances, with emphasis on the jitter resulting from the interaction between the control system and structural dynamics.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.7.2 Sub-Task 7.2 – Electromagnetic and Electronic

Under this subtask, the Contractor shall analyze, design, fabricate, test, and integrate electronic systems for the measurement and control of thermal, mechanical, and electromechanical systems.

Requirements under this subtask shall include, but may not be limited to, the design, analysis, fabrication, testing and troubleshooting of: (a) power electronic circuits for the drive and commutation of motors; (b) precision, low noise signal conditioning and interface electronics for sensors, optical encoders, and thermistors; (c) digital and microprocessor-based controllers for the implementation of command and telemetry functions; (d) embedded software for microprocessor-based systems to implement digital filtering and control algorithms in sampled data systems, perform worst-case, failure mode and performance sensitivity analysis of electronic systems to verify design suitability for the range of operational and survival temperatures and the cosmic radiation environments; (e) grounding, shielding, Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC) problems; (f) the interconnecting harness for electronic assemblies; and (g) calculation of the electromagnetic fields and the electromagnetically generated forces in electrical machinery.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.3.8 TASK 8 – HARDWARE FABRICATION AND TESTING, INSPECTION, ASSEMBLY, AND INTEGRATION

Pursuant to this task, the Contractor shall develop instrument system hardware for protoflight, flight, ground support and test applications. The hardware associated with this task shall, as a minimum, include structural components, mechanisms, electromechanical devices, electronic components, heat pips, thermal blankets (MLI), and other devices to support Space Science Division programs.

C.3.8.1 Sub-Task 8.1 – Hardware Fabrication

Pursuant to this subtask, the Contractor shall fabricate hardware for flight (including protoflight) and non-flight (including prototype) instruments, payloads and related spacecraft primary structures, secondary structures, instrument structures, mechanical subassemblies, components, mechanisms, electromechanical devices, and thermal flight experiments.

The Contractor shall also fabricate or otherwise provide (a) mechanical ground support equipment, and (b) special test and evaluation equipment (including electronic equipment) necessary to support the operation of all mechanical hardware.

In situations where hardware fabrication is required in a quick reaction mode and the Contractor determined to perform the task under subcontract, the Contractor shall minimize both the subcontract implementation and fabrication phases of the task.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.8.2 Sub-Task 8.2 – Hardware Testing

Under this subtask, the Contractor shall perform mechanical testing, as directed, for flight and non-flight mechanical and mechanisms hardware development efforts. The required testing shall include, but may not be limited to, performance and life testing of mechanisms and electromechanical devices. The Contractor shall provide all necessary equipment to perform the required testing of all mechanical hardware.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.8.3 Sub-Task 8.3 – Hardware Inspection

Under this subtask, the Contractor shall perform flight hardware inspections for all hardware fabricated/provided under this contract, which shall include, but may not be limited to, (a) dimensional, (b) NDE, (c) fracture control, and (d) workmanship inspections.

Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003.

C.3.8.4 Sub-Task 8.4 – Hardware Protective Coatings and Multilayer Insulation

Under this subtask, the Contractor shall (a) provide iridite, anodize, or comparable coating proceses to finish metal services; (b) prime and paint surfaces, parts, and assemblies as required, and (c) provide and install multilayer insulation.

C.3.8.5 Sub-Task 8.5 – Assembly, Integration and Testing

Under this subtask, the Contractor shall assemble, test and integrate thermal, mechanical, electromechanical, and electronic flight instruments, and optical systems and subsystems. Requirements under this subtask shall include, but may not be limited to: (a) designing test sequences, establishing pass/fail criteria, and writing test procedures to characterize or verify the performance of systems under test; (b) choosing the proper transducers, instrumentation and test equipment required for the test based on the performance requirements and specified operational environment; (c) conducting the test; and (d) analyzing the test data and preparing reports summarizing the test results. The Contractor shall provide test and instrumentation capabilities to support these activities.

Further requirements under this subtask include, but may not be limited to, (a) measurement of bearing torque; (b) measurement of residual momentum; (c) modal surveys of structures and mechanisms; (d) measurement of transfer functions and transient behavior of thermal, structural, mechanical, electromechanical, and electronic components and systems; (e) life testing of electromechanical assemblies; (f) measurement of disturbance rejection and jitter performance; (g) reduction and display of test data; (h) automation of test sequences and data acquisition; (i) implementation of signal processing algorithms to identify trends; (j) extraction of modal parameters; and (k) calculation of transfer functions and power spectral densities.
Data Deliverables under this subtask shall be in accordance with Contract Data Requirements List Item A003 and A004.

C.4.0 CONTRACTOR REQUIREMENTS

C.4.1 Program Management and Control

The Contractor shall provide the leadership and management skills necessary to satisfy the objectives and requirements of this Statement of Work.

The Contractor shall appoint a Program Manager (PM) who shall have overall responsibility for the contracted effort. The PM shall be the single point of contact and interface with the Government for all matters concerning technical progress and problems, program performance, scheduling, resource coordination, and all other program related activities.

C.4.2 Reports, Data and Other Deliverables

The Contractor shall provide data deliverables as required under Exhibit A, DD Form 1423, Contract Data Requirements List, and all enclosures thereto. Specific requirements for all reports, data, and other deliverables may be found under Enclosure 3 to Exhibit A.

C.4.3 Quick Response

This Contract has a Quick Response requirement. Key and resource personnel employed by the Contractor shall respond to quick response situations within 2 hours.

ATTACHMENT 2:
WORKFORCE QUALIFICATIONS AND EXPERIENCE

It is anticipated that the following labor categories will be required under any resulting contract: (a) Program Manager, (b) Senior Thermal Engineer, (c) Thermal Engineer, (d) Senior Contamination Engineer, (e) Contamination Engineer, (f) Senior Instrument Optical Engineer, (g) Instrument Optical Engineer, (h) Senior Systems Engineer, (i) Systems Engineer, (j) Senior Electrical Engineer, (k) Electrical Engineer, (l) Senior Electromechanical Systems Engineer, (m) Electromechanical Systems Engineer, (n) Senior Mechanical Systems Engineer, (o) Mechanical Systems Engineer, (p) Junior Engineer, (q) Senior Mechanical Designer, (r) Mechanical Designer, (s) Junior Designer, (t) Senior Integration Technician, (u) Integration Technician, (v) Junior Technician.

(**) – Denotes Anticipated Key Personnel

(1) **PROGRAM MANAGER(**)**

Educational Requirements – The Program Manager/Senior Scientist shall, as a minimum, possesses a Bachelor of Science degree in engineering, mathematics, or physics from an accredited institution.

Experience – The Program Manager/Senior Scientist shall possess a minimum of 10 years of demonstrated progressively responsible experience with a particular background in the development of aerospace hardware. The Program Manager shall (l) demonstrate supervisory/management experience suited to the requirements of this project, (b) demonstrate the ability to successfully interact with customer management, and (c) demonstrate aerospace hardware test activity experience.

(2) **SENIOR THERMAL ENGINEER**

Educational Requirements – The Senior Thermal Engineer shall, as a minimum, possess a Bachelor of Science Degree in engineering, mathematics or physics from an accredited institution.

Experience – The Senior Thermal Engineer shall possess a minimum of 10 years of demonstrated experience in thermal design and thermal analysis, which shall include demonstrable experience in (i) conceptual thermal design, (ii) development of thermal analytical models, and (ii) thermal analyses of spacecraft and instruments for ELV and STS payloads. The Senior Thermal Engineer shall possess a minimum of ten years of demonstrable experience with thermal computer programs such as SINDA. The Senior Thermal Engineer shall also possess demonstrable team leadership experience for a team of at least 5 people.

(3) **THERMAL ENGINEER**

Educational Requirements – The Thermal Engineer shall, as a minimum, possess a Bachelor of Science Degree in engineering, mathematics or physics from an accredited institution.

Experience – The Thermal Engineer shall possess a minimum of 5 years of demonstrated experience in Thermal design and thermal analysis, which shall include demonstrable experience in (i) development of thermal analytical models, and (ii) thermal analyses of spacecraft and instruments for ELV and STS payloads using thermal computer programs like SINDA.

(4) **SENIOR CONTAMINATION ENGINEER**

Educational Requirements – The Senior Contamination Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering, mathematics, or physics from an accredited institution.

Experience – The Senior Contamination Engineer shall possess a minimum of 5 years of demonstrated experience in contamination management and contamination analysis, which shall include demonstrable experience in (i) contamination control, (ii) requirement development, (iii) detailed environmental analysis, and (iv) contamination impact assessment of several flight systems.

(5) **CONTAMINATION ENGINEER**

Educational Requirements – The Contamination Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering, mathematics, or physics from an accredited institution.

Experience – The Contamination Engineer shall possess a minimum of five years of demonstrated experience in contamination management and contamination analyses, which shall include demonstrable experience in (i) contamination control requirement development, (ii) detailed environmental analysis, and (iii) contamination impact assessment. The Contamination Engineer shall also possess a minimum of three years of demonstrable experience with computer systems and contamination programs.

(6) **SENIOR INSTRUMENT OPTICAL ENGINEER**

(a) Educational Requirements – The Senior Instrument Optical Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering, mathematics, or physics from an accredited institution.

(b) Experience – The Senior Instrument Optical Engineer shall possess at least 10 years experience in optical design and analysis of space instruments, which shall include demonstrable experience with a variety of analytical codes for (i) optical design and analysis, (ii) wavefront propagation, (iii) multipath configurations, (iv) stray light, and (v) analysis of interferograms.

(7) **INSTRUMENT OPTICAL ENGINEER**

(a) Educational Requirements – The Instrument Optical Engineer shall, as a minimum, possess a Bachelor of Science Degree in engineering, mathematics, or physics from an accredited institution.

(c) (b) Experience – The Instrument Optical Engineer shall possess at least 5 years of demonstrated experience in the optical design and analysis of space instruments, which shall include demonstrable experience with a variety of analytical codes for (i) optical design and analysis, (ii) wavefront propagation, (iii) multipath configurations, (iv) stray light, and (v) analysis of interferograms.

(8) **SENIOR SYSTEMS ENGINEER**

Educational Requirement – The Senior Systems Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering or physics from an accredited institution.

Experience – The Senior Systems Engineer shall possess at least 10 years of demonstrated experience in the analysis and design of space flight systems, which shall include demonstrable experience in (i) component tolerancing and tolerancing sensitivity, (ii) radiometry (receivers, detectors and detector arrays), (iii) stray light/energy, (iv) alignment and calibration, (v) Structural-Thermal-Optical (STOP) analysis, (vi) system behavior, (vii) system error budgets and tolerances of subsystems, instruments and spacecraft, (vii) establishment of component tolerances based on allowable tolerance sensitivities, performance degradation, and error budgets, and (viii) RF, digital and analog circuit design and analysis.

(9) **SYSTEMS ENGINEER**

Educational Requirements – The Systems Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering or physics from an accredited institution.

Experience – The Systems Engineer shall possess at least 5 years of demonstrated experience in the analysis and design of space flight systems, which shall include demonstrable experience in (i) component tolerancing and tolerancing sensitivity, (ii) radiometry (receivers, detectors and detector arrays), (iii) stray light/energy, (iv) alignment and calibration, (v) Structural-Thermal-Optical (STOP) analysis, (vi) system behavior, (vii) system error budgets and tolerances of subsystems, instruments and spacecraft, (vii) establishment of component tolerances based on allowable tolerance sensitivities, performance degradation, and error budgets, and (viii) control systems and the effect of structural modes on control system performance.

(10) **SENIOR ELECTRICAL ENGINEER**

Educational Requirements – The Senior Electrical Engineer shall, as a minimum, possess a Bachelor of Science Degree in engineering, physics or mathematics from an accredited institution.

Experience – The Senior Electrical Engineer shall possess at least 10 years of demonstrated experience in the analysis, desgin and development of electrical and electronic systems for spaceborne applications, including hands-on work in the fabrication, ground testing and integration, and on-orbit operation of flight hardware. More specifically, the Senior Electrical Engineer shall possess demonstrable experience in (i) analysis, design and testing of analog and digital circuitry for the measurement and control of thermal and electromechanical systems using continuous or sampled data techniques, including the use of programmable logic arrays, software development and

hardware interfacing in microprocessor-based systems; (ii) analysis and design of control systems, (iii) the operation and interfacing to the spacecraft's command, telemetry and power subsystems, sensors and actuators, (iv) the design of electronic instrumentation systems from the standpoint of grounding, shielding and Electromagnetic Compatibility (EMC), (v) component ratings, performance limitation and the effects of cosmic radiation, (vi) the modeling and management of thermal effects that result from power dissipation in electrical components.

(11) **ELECTRICAL ENGINEER**

Educational Requirements – The Electrical Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering, physics or mathematics from an accredited institution..

Experience – The Electrical Engineer shall possess at least 5 years of demonstrated experience in the analysis, design and development of electrical and electronic systems for spaceborne applications, including hands-on work in the fabrication, ground testing and integration, and on-orbit operation of flight hardware. More specifically, the Senior Electrical Engineer shall possess demonstrable experience in (i) analysis, design and testing of analog and digital circuitry for the measurement and control of thermal and electromechanical systems using continuous or sampled data techniques, including the use of programmable logic arrays, software development and hardware interfacing in microprocessor-based systems; (ii) analysis and design of control systems, (iii) the operation and interfacing to the spacecraft's command, telemetry and power subsystems, sensors and actuators, (iv) the design of electronic instrumentation systems from the standpoint of grounding, shielding and Electromagnetic Compatibility (EMC), (v) component ratings, performance limitation and the effects of cosmic radiation, (vi) the modeling and management of thermal effects that result from power dissipation in electrical components.

(12) **SENIOR ELECTROMECHANICAL SYSTEMS ENGINEER**

Educational Requirements – The Senior Electromechanical Systems Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering, mathematics or physics from an accredited institute.

Experience – The Senior Electromechanical Systems Engineer shall possess at least 10 years of demonstrated experience in the analysis and design of space flight control systems, which shall include demonstrable experience in (i) hands-on work with flight hardware at all stages of development, design, fabrication and construction, testing, qualification and on-orbit operation; (ii) control/structure interaction; and (iii) performance in the presence of jitter. The Senior Electromechanical Systems Engineer shall also possess demonstrable experience in the modelling of mechanical, electronic, electromechanical, and thermal control systems using such tools as MATLAB.

(13) **ELECTROMECHANICAL SYSTEMS ENGINEER**

Educational Requirements – The Electromechanical Systems Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering, mathematics, or physics from an accredited institution.

Experience – The Electromechanical System Engineer shall possess at least 5 years of demonstrated experience in the analysis and design of space flight control systems, including (i) an understanding of control/structure interaction, (ii) an understanding of performance in the presence of jitter, and (iii) hands-on experience in the modeling of mechanical, electronic, and electromechanical control systems using such tools as MATLAB.

(14) **SENIOR MECHANICAL SYSTEMS ENGINEER**

Educational Requirements – The Senior Mechanical Systems Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering, mathematics, or physics from an accredited institution.

Experience – The Senior Mechanical Systems Engineer shall possess at least 10 years of demonstrated experience in the design and testing of aerospace hardware, which shall include demonstrable experience in specific aerospace project-related design and analysis efforts for the development of spacecraft mechanical systems, and subsystems. The Senior Mechanical Systems Engineer shall also possess demonstrable team leadership experience for a team of at least 5 people.

(15) **MECHANICAL SYSTEMS ENGINEER**

Educational Requirements – The Senior Mechanical Systems Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering, mathematics, or physics from an accredited institution.

Experience – The Mechanical Systems Engineer shall possess at least 5 years of demonstrated experience in the analysis, design, testing, and optical alignment of aerospace hardware, which shall include demonstrable experience in specific aerospace project-related engineering efforts associated with the development of spacecraft mechanical systems.

(16) **JUNIOR ENGINEER**

Educational Requirements – The Senior Mechanical Systems Engineer shall, as a minimum, possess a Bachelor of Science degree in engineering, mathematics, or physics from an accredited institution.

Experience – The Junior Engineer shall possess at least 2 years of demonstrated experience in the analysis of engineering problems.

(17) **SENIOR MECHANICAL DESIGNER**

Educational Requirements – The Senior Mechanical Designer shall, as a minimum, possess a High School diploma.

Experience – The Senior Mechanical Designer shall possess at least 10 years of demonstrable experience in the design and development of aerospace hardware, which shall include (i) demonstrable experience in specific spacecraft hardware design, (ii) demonstrable detailed knowledge of current aerospace design practices and hardware, (iii) demonstrable knowledge of

NASA Engineering Drawing Standards Manual (X-673-64-1), and (iv) demonstrable knowledge of Dimensioning and Tolerancing in accordance with ANSI Y14.5M.

(18) **MECHANICAL DESIGNER**

Educational Requirements – The Mechanical Designer shall, as a minimum, possess a High School diploma.

Experience – The Mechanical Designer shall possess at least 5 years of demonstrable experience in the design of aerospace or related hardware, which shall include (i) demonstrable specific design experience with layout or piece part drawings, (ii) demonstrable knowledge of NASA Engineering Drawing Standards Manual (X-673-64-1), and (iii) demonstrable knowledge of Dimensioning and Tolerancing in accordance with ANSI Y14.5M.

(19) **JUNIOR DESIGNER**

Educational Requirements – The Junior Designer shall, as a minimum, possess a High School diploma.

Experience – The Junior Designer shall possess at least 2 years of demonstrable experience in the design of aerospace or related hardware, which shall include (i) demonstrable specific design experience with layout or piece part drawings, (ii) demonstrable knowledge of NASA Engineering Drawing Standards Manual (X-673-64-1), and (iii) demonstrable knowledge of Dimensioning and Tolerancing in accordance with ANSI Y14.5M.

(20) **SENIOR INTEGRATION TECHNICIAN**

Educational Requirements – The Senior Integration Technician shall, as a minimum, possess a High School diploma.

Experience – The Senior Integration Technician shall possess at least 10 years of experience and specialization in (i) the manufacture, integration and testing of either mechanical, electrical, thermal or mechanism instrument-related hardware. The Senior Integration Technician shall demonstrate applicable knowledge of and work experience with issues related to, but not limited to, aerospace systems, contamination and cleaning procedures, and handling and assembly of flight mechanisms and mechanical, thermal or electrical hardware. The Senior Integration Technician shall also demonstrate at least 11 years of specific discipline, aerospace experience, and demonstrable team leadership experience for a team of at least 3 people.

(21) **INTEGRATION TECHNICIAN**

Educational Requirements – The Integration Technician shall, as a minimum, possess a High School diploma.

Experience – The Integration Technician shall possess at least 5 years of experience and specialization in (i) the manufacture, integration and testing of either mechanical, electrical, thermal or mechanism instrument-related hardware. The Integration Technician shall demonstrate applicable

knowledge of and work experience with issues related to, but not limited to, aerospace systems, contamination and cleaning procedures, and handling and assembly of flight mechanisms and mechanical, thermal or electrical hardware. The Integration Technician shall also demonstrate at least 6 years of specific discipline and aerospace experience.

(22) **JUNIOR TECHNICIAN**

Educational Requirements – The Junior Technician shall, as a minimum, possess a High School diploma.

Experience – The Junior Technician shall possess at least 2 years of experience in (i) the manufacture, integration and testing of either mechanical, electrical, thermal or mechanism instrument-related hardware. The Junior Technician shall also demonstrate at least 1 year of specific discipline and aerospace experience.

CONTRACT DATA REQUIREMENTS LIST
(2 Data Items)

Form Approved OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0002/0004/0006/0008/0010	A	TDP ____ TM ____ OTHER ____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
	RFP:N00173-00-R-RS01	(To Be Determined At Time of Award)

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A001	Monthly Cost and Performance Reports		18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	Sections B, C, and H	NRL Code (Provided at Award)

7. DD 250 REQ	8. DIST STATEMENT REQUIRED	9. FREQUENCY	10. DATE OF FIRST SUBMISSION
LT		Monthly	See Block 16
8. APP CODE		**11. AS OF DATE**	**12. DATE OF SUBSEQUENT SUBMISSION**
		0	See Block 16

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final Reg	Final Repro
NRL Code *****		1	0
15. TOTAL →		1	0

16. REMARKS

Written reports, in accordance with Enclosure No. 2 to this Exhibit, shall be made monthly.

Block 12 - 10 calendar days after the end of the first month after contract execution.

Block 13 - 10 days after the end of each subsequent month.

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A002	Contract Final Report		18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	Sections B, C, F, and H	NRL Code (Provided at Award)

7. DD 250 REQ	8. DIST STATEMENT REQUIRED	9. FREQUENCY	10. DATE OF FIRST SUBMISSION
DD**		One/R	
8. APP CODE		**11. AS OF DATE**	**12. DATE OF SUBSEQUENT SUBMISSION**
		See Block 16	

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final Reg	Final Repro
NRL Code ****		1	
ACO		1	
15. TOTAL →		2	

16. REMARKS

Block 11: 60 days after contract completion

A final report is defined as a scientific or technical report which summarizes all work accomplished under the Contract.

Reprints of published articles may be accepted as technical reports with the concurrence of the COR

** DD 250 required only for acceptance by the COR designated in Section G.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
NRL-SSC CODE 3235: RDS	01 NOV 1999		

CONTRACT DATA REQUIREMENTS LIST
(2 Data Items)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0002/0004/0006/0008/0010	A	TDP _____ TM _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
	RFP: N00173-00-R-RS01	(To Be Provided At Time of Award)

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A003	Formal and Informal Technical Reports		18. ESTIMATED TOTAL PRICE

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	Sections B, C, and H	NRL Code (Provided at Award)

7. DD 250 REQ	8. DIST STATEMENT REQUIRED	9. FREQUENCY	10. DATE OF FIRST SUBMISSION
LT		One/R	See Block 16
11. APP CODE		**12. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
		0	See Blcok 16

14. DISTRIBUTION			
a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
NRL Code ****		1	

16. REMARKS

Block 12 - 90 days after completion of task or end of period of performance, whichever is first.

Block 13 - 2 weeks after notification from Contracting Officer's Representative.

SEE ENCLOSURE 3 TO THIS EXHIBIT FOR DETAILED REQUIREMENTS

*For written technical reports and for letter reports containing scientific or technical information, the distribution shown in Enclosure (1) to this Exhibit applies.

15. TOTAL →		1	

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A004	Software/Databases/Models/Algorithms/Decision Support Systems, Documentation/Instructions/Code, etc.		18. ESTIMATED TOTAL PRICE

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	Sections B, C, F, and H	NRL Code (Provided at Award)

7. DD 250 REQ	8. DIST STATEMENT REQUIRED	9. FREQUENCY	10. DATE OF FIRST SUBMISSION
LT		One/R	See Block 16
11. APP CODE		**12. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
			See Block 16

14. DISTRIBUTION			
a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
NRL Code ****		1	

16. REMARKS

Block 12 - 90 days after completion of task or end of period of performance, whichever is first.

Block 13 - 2 weeks after notification from the Contracting Officer's Representative

SEE ENCLOSURE 3 TO THIS EXHIBIT FOR DETAILED REQUIREMENTS

15. TOTAL →		1	

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
NRL SSC CODE 3235:RDS	01 NOV 1999		

CONTRACT DATA REQUIREMENTS LIST

(2 Data Items)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0002/0004/0006/0008/0010	A	TDP ____ TM ____ OTHER ____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
	RFP: N00173-00-R-RS01	(To Be Provided At Time of Award)

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A005	Progress Reports	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	Sections B, C, and H	NRL Code (Provided at Award)

7. DD 250 REQ	8. DIST STATEMENT	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		Monthly	See Blk. 16
9. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
AD			See Blk. 16

16. REMARKS

Block 12 - End of first full calendar month after Contract award.
Block 13 - 10 days after the end of each subsequent month.

Progress Reports shall be prepared and formatted as specified by the Contracting Officer's Representative in accordance with the Contract clause entitled: Technical Direction Memorandum.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
NRL Code ****		1	
15. TOTAL →		1	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE

7. DD 250 REQ	8. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
9. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**

16. REMARKS

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
15. TOTAL →			

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
NRL-SSC CODE 3235:RDS	01 NOV 1999		

DD Form 1423-2, JUN 90 *Previous editions are obsolete.* Page 3 of 3 Pages

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ENCLOSURE (1) TO DD FORM 1423
INSTRUCTIONS FOR DISTRIBUTION

DISTRIBUTION OF TECHNICAL REPORTS

The minimum distribution of **technical reports** and the **final report** submitted in connection with this contract is as follows:

ADDRESSEE	DODAAD CODE	NUMBER OF COPIES UNCLASSIFIED/ UNLIMITED	AND CLASSIFIED	UNCLASSIFIED/LIMITED
COR Naval Research Laboratory Code: 4555 Overlook Ave., S.W. Washington, DC 20375-5320	N00173	1	1	
Administrative Contracting Officer		1	1	
Director Naval Research Laboratory ATTN: Code: 5227 4555 Overlook Ave., S.W. Washington, DC 20375-5326	N00173	1	1	
Defense Technical Information Center (DTIC) 8725 John J. Kingman Rd. Suite #0944 Fort Belvoir, VA 22060-6218	S47031	4	2	

DISTRIBUTION OF NON-TECHNICAL REPORTS

The minimum distribution of non-technical reports submitted in connection with this contract is as follows:

ADDRESSEE	DODAAD CODE	NUMBER OF COPIES UNCLASSIFIED/ UNLIMITED	AND CLASSIFIED	UNCLASSIFIED/LIMITED
COR	N00173	1	1	
Administrative Contracting Officer (DCMAO)		1	1	

ENCLOSURE NUMBER 2 TO DD FORM 1423
CONTRACT DATA REQUIREMENTS LIST

1. INSTRUCTIONS FOR MONTHLY COST AND PERFORMANCE REPORTING REQUIREMENTS

This report shall specify:

1. Contract Number;
2. Reporting Period Covered by Report;
3. Total Amount Funded for Contract;
4. *Total Amount Invoiced to Date;
5. *Total Amount Invoiced for this Reporting Period ;
6. Estimated Cost to complete - with explanation if more than Total Amount Funded for Contract (See # 3, above);
7. Schedule Status - indicate if efforts are on schedule, or if not, indicate reason(s) for delay and how it affects final delivery;
8. Contractor hours expended on NRL property. This portion of the report shall include the following information: (a) employee name; (b) number of hours worked; and (c) specific contract task involved for each employee;
9. Technical Progress - brief narrative indicating technical progress made, significant accomplishments or meetings attended and/or participated in;
10. Briefs/Reports generated;
11. Travel Activity;
12. Plans for next month;
13. Technical problem areas and potential solutions.
14. Detailed Report of Costs Incurred. The Contractor shall provide a detailed breakdown of costs incurred during the reporting period, including number of hours worked by each employee as well as wage rate, overhead, G&A, and fee costs. If employee has worked on multiple tasks, accounting for each task shall be shown separately. Contractor shall also provide a detailed breakdown of other costs incurred, which shall include, but may not be limited to, travel costs, material costs, and all other direct and indirect costs associated with performance of this contract. This report shall be submitted with a copy of the monthly invoice.

*This shall also include a breakdown by ACRNs prorated in proportion to the unliquidated balance. (See Section G.)

ENCLOSURE NUMBER 3 TO DD FORM 1423
CONTRACT DATA REQUIREMENTS LIST

REPORTING REQUIREMENTS FOR CDRL A003 –
FORMAL AND INFORMAL TECHNICAL REPORTS

For the purpose of this solicitation and any resulting contract, the term “technical reports” shall include, but may not be limited to, any of the following activities:

a. Conducting studies, reviews, evaluations, analyses, tests, and inspections, and providing written reports on any and all findings made during these activities.

b. Establishing parameters, limits, tolerances, or other measurement criteria as directed, and providing written reports on these activities.

c. Preparing or Developing specifications, recommendations, procedures, reports, plans, technical designs, technical drawings, designs, schematics, requirements documentation, systems block diagrams, field integration documents, interface control documents, as-built drawings, contamination results, cleanliness results, quality assurance documentation, test results, technical manuals for hardware, instruments, systems, payloads and spacecraft, training documents, and any other documentation which may be required pursuant to performance of this contract.

All deliverables under this CDRL shall be prepared and formatted as specified by the COR in accordance with the Contract Clause entitled: Technical Direction Memorandum.

REPORTING REQUIREMENTS FOR CDRL A004 –
SOFTWARE, DATABASES, MODELS, ALGORITHMS,
DOCUMENTATION, INSTRUCTIONS, SOURCE CODE, ETC.

For the purpose of this solicitation and any resulting contract, deliverables under this CDRL shall include, but may not be limited to, any of the following:

(a) Computer models, (b) databases, (c) algorithms, (d) documentation, (e) application software, (f) utility software, (g) upgrades, enhancements, updates, expansions or modifications to existing models, software, algorithms, or other related items, (h) computer processes, (i) technical manuals and user’s guides, (j) user training manuals, (k) software component and system designs, (l) software source or user code, or any other computer-related deliverables which may be required pursuant to performance of this contract.

All deliverables required under this CDRL shall be computer compatible and in the format specified by the COR in accordance with the Contract Clause entitled “Technical Direction Memorandum”.

REPORTING REQUIREMENTS FOR CDRL A005–
PROGRESS REPORTS

The Contractor shall provide monthly progress reports which shall, as a minimum, (a) summarize and problems or areas of concern which have arisen during the reporting period; (b) state any anticipated deviations in the Contractor's planned effort to achieve scientific or technical objective; (c) describe technical progress during the reporting period; (d) cite any major changes in the technical approach planned at the beginning of the reporting period; and (e) draw attention to any anticipated technical, logistic or administrative problems.

The report shall be concise, but shall, as a minimum, contain the following: (a) task objectives, (b) general technical approach, (c) status prior to and at the end of the reporting period, (d) all important findings and their implications for the scientific and technical objectives of this contract, and (e) all significant hardware development.

ATTACHMENT 4:
ACCOUNTING AND APPROPRIATION DATA

(* - Accounting and Appropriation Data will be provided at Contract Award)